

COMMONWEALTH OF VIRGINIA  
DEPARTMENT OF HEALTH

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OFFICE OF RADIOLOGICAL HEALTH  
109 Governor Street, 7<sup>th</sup> Floor, Richmond, Virginia 23219  
Office (804) 864-8150  
Fax (804) 864-8175

**ENVIRONMENTAL  
RADIATION  
MONITORING  
PROGRAM**

**2017  
ANNUAL REPORT**



## **ACKNOWLEDGEMENTS**

The Office of Radiological Health acknowledges the following organizations and agencies that provide assistance to the Radiological Environmental Monitoring Program:

- Babcock & Wilcox
- Department of Agriculture and Consumer Services
  - Office of Dairy and Foods
- Department of Conservation and Recreation
  - Division of State Parks
- Department of General Services
  - Division of Consolidated Laboratory Services (DCLS)
- Dominion Virginia Power
- Newport News Shipbuilding
- Norfolk Naval Shipyard

## PREFACE

The Office of Radiological Health (ORH) maintains an extensive environmental monitoring program in order to characterize radiological conditions around certain fixed nuclear facilities in the Commonwealth of Virginia. This program provides an independent assessment of each facility's compliance with applicable federal and state regulations as they relate to offsite release limits. Each of these fixed nuclear facilities has its own routine surveillance program. The objectives of ORH's environmental monitoring program include:

- a) Providing information useful in assessing the adequacy of programs designed to protect the public;
- b) Meeting the requirements of regulatory agencies;
- c) Verifying radionuclide containment and plant waste management practices;
- d) Meeting legal liability obligations; and
- e) Providing public assurance and acceptance (NCRP, 1976)\*.

In addition to these stated objectives, ORH has identified other objectives such as;

- a) Maintenance of a database containing background radionuclide levels and trends to assist with the assessment of other environmental data;
- b) Identification of radiological releases not associated with the licensed facility; and
- c) Maintenance of equipment and procedures used in emergency preparedness and response activities.

This report is distributed to the licensee, as well as state and local agencies, which have a direct interest in the results. This report is available for download at:

<http://www.vdh.virginia.gov/radiological-health/environmental-monitoring/>

Readers are invited to submit any comments or questions regarding this report to the Office of Radiological Health.

\*NCRP (2006) National Council on Radiation Protection and Measurements, *Environmental Radiation Measurements* (1976) - Report No. 050, National Council on Radiation Protection and Measurements, Washington.

# **SAMPLING PROGRAM**

## **AIR PARTICULATE AND RADIOGAS**

Stationary air samplers are utilized at the Surry and North Anna Power Stations. In addition, a third stationary air sampler is located at Pocahontas State Park which serves as a control site. Pumps run approximately 168 hours per week at an average flow rate of 115 cubic feet per hour. All samplers are continuously equipped with a charcoal filter and an air particulate filter which are analyzed weekly for gross beta and gamma activity with special emphasis on Iodine-131 retention. All stations, except the control site, are collocated with utility air samplers.

There is one air sampler located onsite at Babcock & Wilcox Technologies. This air pump is equipped with air particulate filters and runs approximately 168 hours per week with an average flow rate of 70 cubic feet per hour. Samples from this location are obtained quarterly and undergo gross alpha analysis

## **FISH**

Fish samples are collected biannually in Lake Anna near the North Anna Power Station and from the discharge canal at Surry Power Station. Each sample consists of approximately one kilogram of flesh from a variety of fish species. All fish samples are counted for gamma activity with data based on wet weight.

## **MILK**

Raw milk samples are collected quarterly from a dairy near each power station. Each sample consists of one gallon of raw milk with no preservatives added. Raw milk is a primary indicator of radioiodine incorporation in the food chain. Samples are analyzed for gamma activity and Strontium-89 & 90. Milk samples are further radiochemically separated for Iodine-131.

## **SHELLFISH**

Shellfish are indicators of incorporation of radioactivity in the food chain. Selected species are collected as a part of the environmental surveillance program around Surry Power Station (SPS). Samples consist of one kilogram of flesh and are collected annually approximately 0.5 mile off the mouth of the SPS discharge canal in the James River. All shellfish samples are counted for gamma activity with data based on activity per unit of wet weight.

## **SILT**

Silt is an indicator of radioactive deposition in sediment. Samples are collected biannually next to the Waste Treatment Building at North Anna Power Station and from the discharge canal at Surry Power Station. Silt is also collected quarterly at the Norfolk Naval Shipyard on the Elizabeth River and at Newport News Shipbuilding on the James River. Silt samples are counted for gross alpha and/or beta activity depending on collection location. Selected silt samples are further analyzed for gamma activity. Data is based on activity per unit of dry weight.

## **SOIL**

Two soil samples are collected annually at the Babcock & Wilcox facility. Samples are collected from a ball field on the facility's eastern boundary and from Riverside Park. Samples obtained undergo alpha analysis.

## **VEGETATION**

Green leafy vegetation can serve as an indicator of incorporation of radioactivity in the food chain. Samples are collected biannually from home gardens, small farms, or other suitable locations located near each nuclear power station. Samples typically consist of approximately one kilogram of broad leaf plant species. When leafy vegetation is unavailable, tall grass or similar plants may be substituted. Vegetation is counted for gamma activity with data based on activity per unit wet weight.

In addition to vegetation collected near each nuclear power station, samples are collected annually from two sites at Babcock & Wilcox. Samples consist of approximately one kilogram of grass or broad leaf plant species collected from the ball field at the eastern site boundary and from Riverside Park. These samples undergo alpha analysis.

## **SURFACE WATER**

Surface water is collected weekly near the discharge point at each nuclear power facility. Automatic sampling units designed to pull three aliquots of water per day operate continuously throughout the week. All water collected is composited and tested to provide data on radioactive effluents. In addition to the samples collected near the power stations, control sites on Lake Anna and the James River are also tested on a weekly basis.

Surface water is also collected quarterly on the James River at Newport News Shipbuilding (NNSB) and on the Elizabeth River at the Norfolk Naval Shipyard (NNSY) to ensure that operations at these facilities result in minimal radioactive effluents.

Two surface water samples are collected annually from the James River at Babcock & Wilcox. Samples are collected from the ball field at the eastern site boundary and from Riverside Park. Samples undergo uranium separation followed by alpha counting.

## **AMBIENT GAMMA EXPOSURE**

Ambient gamma exposure readings are collected using optically stimulated luminescence dosimeters (OSLDs) located strategically around each power station. There are a total of twelve OSLD sample locations at North Anna Power Station and fourteen sites at Surry Power Station. One control OSLD station is located at Pocahontas State Park. The OSLD's are processed quarterly for net exposure by ORH staff using a Landauer microStar system. This analysis results in a millirem/quarter reading.

## **REPORTING PENDING SAMPLE ANALYSIS RESULTS**

When sample data fields in this report indicate that results have not yet been performed or reported by DCLS at the time of report publication, then the report will be updated once those results are made available.

## **Sources of Radioactivity in the Environment**

Naturally occurring or background radioactivity is found virtually everywhere within the environment. The decay of primordial terrestrial sources, such as uranium and thorium, is one contributing factor to this background radioactivity. Other sources are continually produced in our upper atmosphere through the interaction of atoms with cosmic rays.

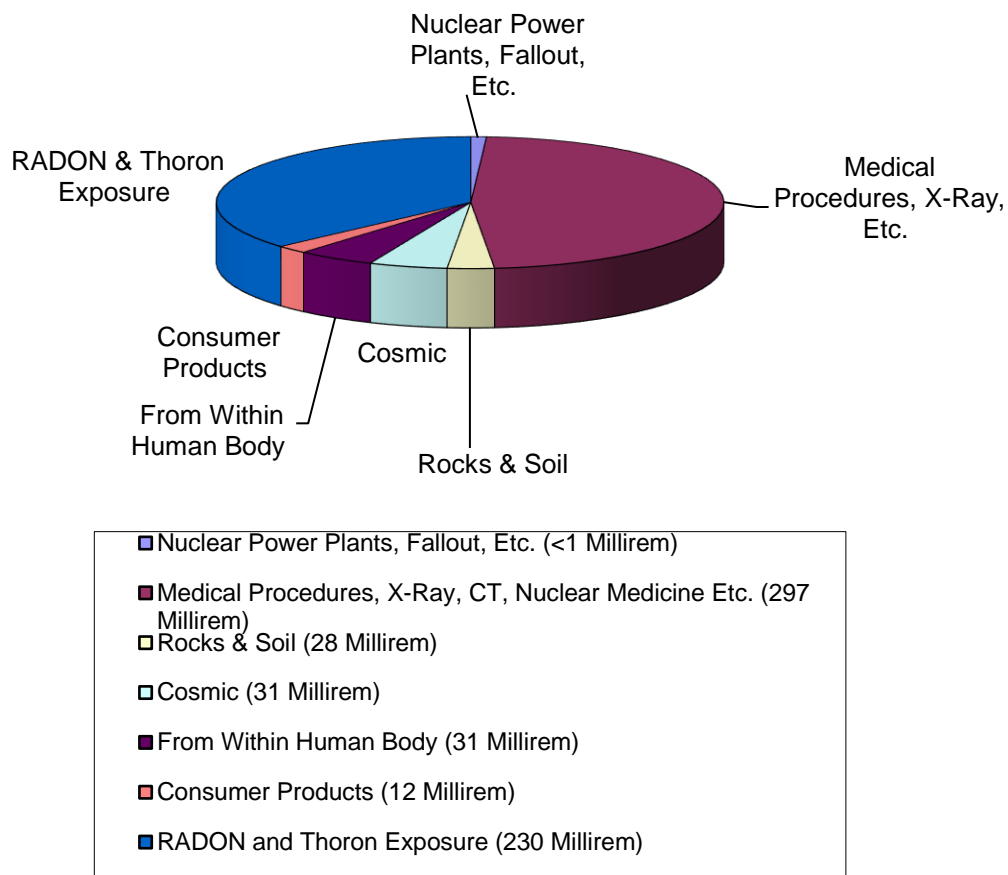
Environmental radiation levels are also influenced by human practices. The use of radioactive materials in the healing arts, uranium mining and milling operations, and nuclear power generation all are potentially contributing factors. In addition, background radiation levels were altered by residual fallout from nuclear weapons testing. The United States ceased atmospheric testing following adoption of the 1963 Nuclear Test Ban Treaty. Only long-lived fallout radionuclides currently remain.

## **Dose to the Public**

The primary source of natural radiation dose received by the general public is due to radon exposure (see Figure 1 next page). The average individual receives approximately 230 millirem/year from radon and less than 1 millirem/year from nuclear facilities; another 81 millirem/year are received from natural sources and approximately 297 mrem/year from medical procedures. The total average whole body dose nationwide is approximately 620 mrem/year.

Inherent in all standards for radiation control is the philosophy of limiting exposure whenever possible. This principle is termed "AS LOW AS REASONABLY ACHIEVABLE" (ALARA). In practice, this philosophy continues to result in very low average doses to the public from the nuclear facilities cited earlier. The environmental monitoring program maintained by the Office of Radiological Health continues to verify compliance to these standards.

**FIGURE 1: Sources of Radiation Exposure**



Source: National Council on Radiation Protection & Measurement; Estimated Annual Dose of 620 Millirem for an average person in the U.S.A.

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# Sampling Locations



# Sampling Locations for Surry Nuclear Power Station



Photo Courtesy of Dominion Power

LOCATION	TYPE	FREQUENCY	PAGE
<b><u>AIR / CHARCOAL FILTER</u></b>			
SPS-A-1 Surry Power Station	Air Particulate	Weekly	15 – 17
	Release Gas	Weekly	30 – 32
SPS-A-2 Jamestown State Park - Historical Site	Air Particulate	Weekly	18 – 20
	Release Gas	Weekly	33 – 35
<b><u>SURFACE WATER</u></b>			
SPS-W-1 Surry Discharge Canal	Surface Water	Weekly	45 – 48
SPS-W-2 James River – Robious Landing	Surface Water	Weekly	49 – 52
SPS-W-3 James River – Scotland Wharf	Surface Water	Weekly	53 – 56
<b><u>FISH</u></b>			
SPS-F-1 James River – .5 miles off Discharge Canal	Edible Fish	2x per year	72 – 73
SPS-R-1 James River – Various Locations	Shellfish	Annually	74
<b><u>SEDIMENT</u></b>			
SPS-S-1 James River - 1/2 Mile Off Discharge Canal	Sediment	2x per year	75
<b><u>MILK</u></b>			
SPS-M-1 Surry County - W.B. Epps Dairy	Raw	Quarterly	81 – 82
<b><u>DOSIMETER</u></b>			
D-42 Surry County - Lawnes Creek	Gamma in Air	Quarterly	83 – 86
D-43 Surry County - Route 628	Gamma in Air	Quarterly	
D-44 Jamestown State Park - Historical Site	Gamma in Air	Quarterly	
D-45 Newport News - Lee Hall	Gamma in Air	Quarterly	
D-73 Naval Weapons Station - Enlisted Quarters	Gamma in Air	Quarterly	
D-76 Newport News - Fort Eustis	Gamma in Air	Quarterly	
D-77 Williamsburg - Busch Gardens	Gamma in Air	Quarterly	
D-78 Williamsburg - Williamsburg Airport	Gamma in Air	Quarterly	
D-79 Surry County - Scotland Wharf	Gamma in Air	Quarterly	
D-80 Surry County - Bacon's Castle	Gamma in Air	Quarterly	
D-81 Surry County – Alliance	Gamma in Air	Quarterly	
D-82 Surry County - Hog Point	Gamma in Air	Quarterly	
<b><u>VEGETATION</u></b>			
SPS-V-1 Surry County – Local Farmers	Edible Vegetation	2x per year	87

# Sampling Locations for North Anna Nuclear Power Station



Photo Courtesy of Dominion Power

LOCATION	TYPE	FREQUENCY	PAGE
<b><u>AIR / CHARCOAL FILTER</u></b>			
NAPS-A-1 Louisa County - North Anna Power Station	Air Particulate	Weekly	24 - 26
	Gas Release	Weekly	39 - 41
NAPS-A-2 Louisa County – Bumpass Volunteer Fire	Air Particulate	Weekly	27 - 29
	Gas Release	Weekly	42 - 44
<b><u>SURFACE WATER</u></b>			
NAPS-W-1 North Anna Power Discharge Canal	Surface Water	Weekly	57 - 60
NAPS-W-2 North Anna River @ Rt. 651	Surface Water	Weekly	61 - 64
NAPS-W-3 North Anna River @ Rt. 522	Surface Water	Weekly	65 - 68
<b><u>FISH</u></b>			
NAPS-F-1 North Anna Lake - Second Cooling Lagoon	Edible Fish	2x per year	72 - 73
<b><u>SEDIMENT</u></b>			
NAPS-S-1 Waste Treatment shoreline sediment	Sediment	2x per year	75
<b><u>MILK</u></b>			
NAPS-M-1 Louisa County - Lakeside Dairy	Raw	Quarterly	79 - 80
<b><u>DOSIMETER</u></b>			
D-35 NAPS	Gamma in Air	Quarterly	83 - 86
D-50 Louisa County – Mineral	Gamma in Air	Quarterly	
D-51 Louisa County - Wares Crossroads	Gamma in Air	Quarterly	
D-52 Spotsylvania - Good Hope Church	Gamma in Air	Quarterly	
D-53 Spotsylvania - Route 614	Gamma in Air	Quarterly	
D-54 Louisa County - Frederick's Hall	Gamma in Air	Quarterly	
D-84 Louisa County - Route 685	Gamma in Air	Quarterly	
D-85 Spotsylvania Co. - Route 713	Gamma in Air	Quarterly	
D-86 Louisa County – Bumpass Volunteer Fire	Gamma in Air	Quarterly	
D-87 Spotsylvania Co. - Levy	Gamma in Air	Quarterly	
D-88 Louisa Co. - Rt. 700 (near station)	Gamma in Air	Quarterly	
D-89 Louisa County - Aspen Hill	Gamma in Air	Quarterly	
<b><u>VEGETATION</u></b>			
NAPS-V-1 Louisa County – Local Farmers	Edible Vegetation	2x per year	87

## Sampling Locations - Babcock & Wilcox

SAMPLE	LOCATION	TYPE	FREQUENCY	PAGE
<b><u>AIR</u></b>				
B&W-A-1	Eastern Site Boundary - Ballfield	Air Particulate	Quarterly	89
<b><u>SURFACE WATER</u></b>				
B&W-W-1	Eastern Site Boundary - Ballfield	Surface Water	Annually	90
B&W-W-2	James River Riverside Park	Surface Water	Annually	90
<b><u>SOIL</u></b>				
B&W-S-1	Eastern Site Boundary - Ballfield	Soil	Annually	90
B&W-S-2	James River Riverside Park	Soil	Annually	90
<b><u>VEGETATION</u></b>				
B&W-V-1	Eastern Site Boundary - Ballfield	Grass	Annually	91
B&W-V-2	James River Riverside Park	Grass	Annually	91

## Other Sampling Locations in Virginia

SAMPLE	LOCATION	TYPE	FREQUENCY	PAGE
<b><u>Air Filter &amp; Charcoal</u></b>				
<i>Control/naturally occurring background</i>				
PSP-A-1	Pocahontas State Park	Air Particulate Release Gas	Weekly	21 - 23 36 - 38
<b><u>Dosimeters</u></b>				
<i>Control/naturally occurring background</i>				
PSP-D-1	Pocahontas State Park	Air Gamma	Quarterly	83 - 86
<b><u>Silt</u></b>				
NNSB-S-1	James River - NNSB - Pier 1	Silt	Quarterly	76
NNSB-S-2	James River - NNSB- Shipway 11	Silt	Quarterly	76
NNSY-S-1	Elizabeth River - NNSY - Drydock #4	Silt	Quarterly	77
NNSY-S-2	Elizabeth River - NNSY - Drydock #8	Silt	Quarterly	77
NNSY-S-3	Elizabeth River - NNSY - Wet Slip #1	Silt	Quarterly	78
<b><u>Surface Water</u></b>				
NNSB-W-1	James River - NNSB- Pier 1	Surface Water	Quarterly	69
NNSB-W-2	James River - NNSB- Shipway 11	Surface Water	Quarterly	69
NNSY-W-1	Elizabeth River - NNSY - Drydock #4	Surface Water	Quarterly	70
NNSY-W-2	Elizabeth River - NNSY - Drydock #8	Surface Water	Quarterly	70
NNSY-W-3	Elizabeth River - NNSY - Wet Slip #1	Surface Water	Quarterly	71

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### NO DETECTABLE RESULTS "NDR"

In order for a nuclide to be identified in the spectrum and entered into this report, constraints set by the HPGe analysis software need to be satisfied and the results of the confidence index calculation must be greater than the threshold (usually 0.3).

For the maximum confidence index, the following conditions need to be met.

- The nuclide energy peak needs to be within the energy tolerance of the library lines for that nuclide.
- A nuclide with multiple lines, must match the library peaks in the spectrum.
- The number of half-lives that has elapsed, between when the sample was taken and when it was counted, must be less than 10 half-lives or the confidence in the identification is small.

If the confidence index threshold and/or any of the three criteria are not met, then the nuclide is deemed no detectable results, (NDR).

### MINIMUM DETECTABLE ACTIVITY "MDA"

MDA as used in this report is defined as the lowest level of radioactivity that can be consistently and accurately detected in a given sample that is identified in the spectrum.

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# Analytical Results

# Virginia Department of Health

## AIR PARTICULATE

January 1, 2017 through December 31, 2017

### Surry Nuclear Power Plant – SPS-A-1

Surry Power Station – on site

Week #	Station	Date			Gross Beta Activity pCi/meter <sup>3</sup>
		Start		Stop	
1 <sup>1</sup>	SPS-A-1	12/27/16	-	01/03/17	0.02 +/- 0.004
2 <sup>2</sup>	SPS-A-1	01/03/17	-	01/09/17	
3	SPS-A-1	01/09/17	-	01/17/17	0.03 +/- 0.003
4 <sup>3</sup>	SPS-A-1	01/17/17	-	01/23/17	0.02 +/- 0.003
5	SPS-A-1	01/23/17	-	01/30/17	0.03 +/- 0.005
6	SPS-A-1	01/30/17	-	02/06/17	0.07 +/- 0.010
7	SPS-A-1	02/06/17	-	02/13/17	0.04 +/- 0.010
8	SPS-A-1	02/13/17	-	02/21/17	0.04 +/- 0.010
9	SPS-A-1	02/21/17	-	02/27/17	0.05 +/- 0.010
10	SPS-A-1	02/27/17	-	03/06/17	0.04 +/- 0.005
11	SPS-A-1	03/06/17	-	03/13/17	0.04 +/- 0.006
12	SPS-A-1	03/13/17	-	03/20/17	0.03 +/- 0.005
13	SPS-A-1	03/20/17	-	03/27/17	0.05 +/- 0.007
14	SPS-A-1	03/27/17	-	04/03/17	0.04 +/- 0.006
15	SPS-A-1	04/03/17	-	04/10/17	0.04 +/- 0.010
16	SPS-A-1	04/10/17	-	04/17/17	0.04 +/- 0.010
17 <sup>4</sup>	SPS-A-1	04/17/17	-	04/24/17	
18 <sup>5</sup>	SPS-A-1	04/24/17	-	05/01/17	0.03 +/- 0.01

<sup>1</sup> Due to the holidays, 12/26 and 01/02, air sample collection day was adjusted.

<sup>2</sup> Due the snow day 01/09 and holidays 01/13 & 01/16, the air sample collection was extended to 2 weeks.

<sup>3</sup> Due to the holiday, 01/16, air sample collection was for six days.

<sup>4</sup> Due to an equipment failure, air sample was not collected.

<sup>5</sup> Air sampler ran for 6 days this collection period, due to equipment maintenance.

# Virginia Department of Health

## AIR PARTICULATE

January 1, 2017 through December 31, 2017

### Surry Nuclear Power Plant – SPS-A-1

Surry Power Station – on site

Week #	Station	Date			Gross Beta Activity pCi/meter <sup>3</sup>
		Start		Stop	
19	SPS-A-1	05/01/17	-	05/08/17	0.03 +/- 0.000
20	SPS-A-1	05/08/17	-	05/15/17	0.03 +/- 0.004
21	SPS-A-1	05/15/17	-	05/22/17	0.03 +/- 0.010
22	SPS-A-1	05/22/17	-	05/30/17	0.02 +/- 0.003
23	SPS-A-1	05/30/17	-	06/05/17	0.05 +/- 0.010
24 <sup>6</sup>	SPS-A-1	06/05/17	-	06/13/17	0.06 +/- 0.010
25 <sup>7</sup>	SPS-A-1	06/13/17	-	06/19/17	0.03 +/- 0.005
26	SPS-A-1	06/19/17	-	06/26/17	0.04 +/- 0.010
27 <sup>8</sup>	SPS-A-1	06/26/17	-	07/03/17	
28 <sup>9</sup>	SPS-A-1	07/03/17	-	07/10/17	0.04 +/- 0.010
29	SPS-A-1	07/10/17	-	07/17/17	0.05 +/- 0.010
30 <sup>10</sup>	SPS-A-1	07/17/17	-	07/24/17	
31 <sup>11</sup>	SPS-A-1	07/24/17	-	07/31/17	0.04 +/- 0.010
32	SPS-A-1	07/31/17	-	08/07/17	0.05 +/- 0.010
33	SPS-A-1	08/07/17	-	08/14/17	0.05 +/- 0.010
34	SPS-A-1	08/14/17	-	08/21/17	0.07 +/- 0.010
35	SPS-A-1	08/21/17	-	08/28/17	0.04 +/- 0.010
36	SPS-A-1	08/28/17	-	09/05/17	0.04 +/- 0.010

<sup>6</sup> Due to scheduling and other issues, air sample was collected for eight days.

<sup>7</sup> Due to eight-day collection period, week 06/05, this week's air sample collection for was 6 days.

<sup>8</sup> Due to holidays, 7/3 and 7/4, air sample was not collected.

<sup>9</sup> Air sample was collected from 6/26 - 7/10.

<sup>10</sup> Due to Dominion Power's graded exercise, air sample was not collected.

<sup>11</sup> Air sample was collected from 07/17 - 07/31.



# Virginia Department of Health

## AIR PARTICULATE

January 1, 2017 through December 31, 2017

### Surry Nuclear Power Plant – SPS-A-1

Surry Power Station – on site

Week #	Station	Date			Gross Beta Activity pCi/meter <sup>3</sup>
		Start		Stop	
37 <sup>12</sup>	SPS-A-1	09/05/17	-	09/11/17	
38 <sup>13</sup>	SPS-A-1	09/11/17	-	09/18/17	0.03 +/- 0.004
39	SPS-A-1	09/18/17	-	09/25/17	0.10 +/- 0.010
40	SPS-A-1	09/25/17	-	10/02/17	0.05 +/- 0.010
41 <sup>14</sup>	SPS-A-1	10/02/17	-	10/09/17	
42 <sup>15</sup>	SPS-A-1	10/09/17	-	10/16/17	0.02 +/- 0.003
43	SPS-A-1	10/16/17	-	10/23/17	0.09 +/- 0.013
44 <sup>16</sup>	SPS-A-1	10/23/17	-	10/30/17	
45 <sup>17</sup>	SPS-A-1	10/30/17	-	11/06/17	0.04 +/- 0.010
46	SPS-A-1	11/06/17	-	11/13/17	0.03 +/- 0.004
47 <sup>18</sup>	SPS-A-1	11/13/17	-	11/20/17	
48 <sup>19</sup>	SPS-A-1	11/20/17	-	11/27/17	0.03 +/- 0.004
49	SPS-A-1	11/27/17	-	12/04/17	0.06 +/- 0.010
50	SPS-A-1	12/04/17	-	12/11/17	0.03 +/- 0.004
51 <sup>20</sup>	SPS-A-1	12/11/17	-	12/18/17	
52 <sup>21</sup>	SPS-A-1	12/18/17	-	12/25/17	
53 <sup>22</sup>	SPS-A-1	12/25/17	-	01/01/18	

<sup>12</sup> Due to holiday and other scheduling issues, air sample was not collected.

<sup>13</sup> Air sample was collected from 9/05 – 09/18.

<sup>14</sup> Due to the holiday, air sample was not collected.

<sup>15</sup> Air sample was collected from 10/02 – 10/16.

<sup>16</sup> Due to MICL servicing, air sample was not collected.

<sup>17</sup> Air sample was collected from 10/23 – 11/6.

<sup>18</sup> Due to Thanksgiving holiday, air sample was not collected.

<sup>19</sup> Air sample was collected from 11/13 – 11/27.

<sup>20</sup> Due to the MICL needing service, air sample was not collected.

<sup>21</sup> Due to the MICL being serviced and the holiday, air sample was not collected.

<sup>22</sup> Due to the MICL being serviced and the holiday, air sample was not collected.

# Virginia Department of Health

## AIR PARTICULATE

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### Jamestown – SPS-A-2

Jamestown State Park & Historic Site

Week #	Station	Date			Gross Beta Activity pCi/meter <sup>3</sup>
		Start		Stop	
1 <sup>1</sup>	SPS-A-2	12/27/16	-	01/03/17	0.02 +/- 0.003
2 <sup>2</sup>	SPS-A-2	01/03/17	-	01/09/17	
3	SPS-A-2	01/09/17	-	01/17/17	0.02 +/- 0.003
4 <sup>3</sup>	SPS-A-2	01/17/17	-	01/23/17	0.02 +/- 0.003
5	SPS-A-2	01/23/17	-	01/30/17	0.03 +/- 0.004
6	SPS-A-2	01/30/17	-	02/06/17	0.07 +/- 0.010
7	SPS-A-2	02/06/17	-	02/13/17	0.05 +/- 0.010
8	SPS-A-2	02/13/17	-	02/21/17	0.06 +/- 0.010
9	SPS-A-2	02/21/17	-	02/27/17	0.04 +/- 0.010
10	SPS-A-2	02/27/17	-	03/06/17	0.03 +/- 0.005
11	SPS-A-2	03/06/17	-	03/13/17	0.04 +/- 0.006
12	SPS-A-2	03/13/17	-	03/20/17	0.03 +/- 0.004
13	SPS-A-2	03/20/17	-	03/27/17	0.04 +/- 0.006
14	SPS-A-2	03/27/17	-	04/03/17	0.04 +/- 0.005
15	SPS-A-2	04/03/17	-	04/10/17	0.04 +/- 0.010
16	SPS-A-2	04/10/17	-	04/17/17	0.04 +/- 0.010
17	SPS-A-2	04/17/17	-	04/24/17	0.02 +/- 0.003
18	SPS-A-2	04/24/17	-	05/01/17	0.04 +/- 0.010

<sup>1</sup> Due to the holidays, 12/26 and 01/02, air sample collection day was adjusted.

<sup>2</sup> Due the snow day 01/09 and holidays, 01/13 & 01/16, the air sample collection was extended 2 weeks.

<sup>3</sup> Due to the holiday, 01/16, air sample collection was for six days.

# Virginia Department of Health

## AIR PARTICULATE

January 1, 2017 through December 31, 2017

### Jamestown – SPS-A-2

Jamestown State Park & Historic Site

Week #	Station	Date			Gross Beta Activity pCi/meter <sup>3</sup>
		Start	Stop		
19	SPS-A-2	05/01/17	-	05/08/17	0.03 +/- 0.000
20	SPS-A-2	05/08/17	-	05/15/17	0.03 +/- 0.004
21	SPS-A-2	05/15/17	-	05/22/17	0.04 +/- 0.010
22	SPS-A-2	05/22/17	-	05/30/17	0.02 +/- 0.004
23	SPS-A-2	05/30/17	-	06/05/17	0.05 +/- 0.010
24 <sup>4</sup>	SPS-A-2	06/05/17	-	06/13/17	0.07 +/- 0.010
25 <sup>5</sup>	SPS-A-2	06/13/17	-	06/19/17	0.04 +/- 0.010
26	SPS-A-2	06/19/17	-	06/26/17	0.05 +/- 0.010
27 <sup>6</sup>	SPS-A-2	06/26/17	-	07/03/17	
28 <sup>7</sup>	SPS-A-2	07/03/17	-	07/10/17	0.04 +/- 0.010
29	SPS-A-2	07/10/17	-	07/17/17	0.06 +/- 0.010
30 <sup>8</sup>	SPS-A-2	07/17/17	-	07/24/17	
31 <sup>9</sup>	SPS-A-2	07/24/17	-	07/31/17	0.04 +/- 0.010
32	SPS-A-2	07/31/17	-	08/07/17	0.06 +/- 0.010
33	SPS-A-2	08/07/17	-	08/14/17	0.06 +/- 0.010
34	SPS-A-2	08/14/17	-	08/21/17	0.05 +/- 0.010
35	SPS-A-2	08/21/17	-	08/28/17	0.04 +/- 0.010
36	SPS-A-2	08/28/17	-	09/05/17	0.04 +/- 0.010

<sup>4</sup> Due to the holiday and other scheduling issues, air sample was collected for eight days.

<sup>5</sup> Due to eight-day collection period, week 06/05, this week's air collection was 6 days.

<sup>6</sup> Due to holidays, 7/3 and 7/4, air sample was not collected.

<sup>7</sup> Air sample was collected from 6/26 - 07/10.

<sup>8</sup> Due to Dominion Power's graded exercise, air sample was not collected.

<sup>9</sup> Air sample was collected from 07/17 - 07/31.

# Virginia Department of Health

## AIR PARTICULATE

January 1, 2017 through December 31, 2017

### Jamestown – SPS-A-2

Jamestown State Park & Historic Site

Week #	Station	Date			Gross Beta Activity pCi/meter <sup>3</sup>
		Start		Stop	
37 <sup>10</sup>	SPS-A-2	09/05/17	-	09/11/17	
38 <sup>11</sup>	SPS-A-2	09/11/17	-	09/18/17	0.03 +/- 0.004
39	SPS-A-2	09/18/17	-	09/25/17	0.07 +/- 0.010
40	SPS-A-2	09/25/17	-	10/02/17	0.06 +/- 0.01
41 <sup>12</sup>	SPS-A-2	10/02/17	-	10/09/17	
42 <sup>13</sup>	SPS-A-2	10/09/17	-	10/16/17	0.02 +/- 0.003
43	SPS-A-2	10/16/17	-	10/23/17	0.08 +/- 0.011
44 <sup>14</sup>	SPS-A-2	10/23/17	-	10/30/17	
45 <sup>15</sup>	SPS-A-2	10/30/17	-	11/06/17	0.04 +/- 0.005
46	SPS-A-2	11/06/17	-	11/13/17	0.04 +/- 0.005
47 <sup>16</sup>	SPS-A-2	11/13/17	-	11/20/17	
48 <sup>17</sup>	SPS-A-2	11/20/17	-	11/27/17	0.03 +/- 0.004
49	SPS-A-2	11/27/17	-	12/04/17	0.08 +/- 0.010
50	SPS-A-2	12/04/17	-	12/11/17	0.03 +/- 0.005
51 <sup>18</sup>	SPS-A-2	12/11/17	-	12/18/17	
52 <sup>19</sup>	SPS-A-2	12/18/17	-	12/25/17	
53 <sup>20</sup>	SPS-A-2	12/25/17	-	01/01/18	

<sup>10</sup> Due to the holiday and other scheduling issues, air sample was not collected.

<sup>11</sup> Air sample collected from 9/05 - 09/18.

<sup>12</sup> Due to the holiday, air sample was not collected.

<sup>13</sup> Air sample collected from 10/02 - 10/16.

<sup>14</sup> Due to MICL servicing, air sample was not collected.

<sup>15</sup> Air sample collected from 10/23 - 11/06.

<sup>16</sup> Due to Thanksgiving holiday, air sample was not collected.

<sup>17</sup> Air sample collected from 11/13 - 11/27.

<sup>18</sup> Due to the MICL needing service, air sample was not collected.

<sup>19</sup> Due to the MICL being serviced and the holiday, air sample was not collected.

<sup>20</sup> Due to the MICL being serviced and the holiday, air sample was not collected.

# Virginia Department of Health

## AIR PARTICULATE

January 1, 2017 through December 31, 2017

### Pocahontas – PSP-A-1

Pocahontas State Park - Control

Week #	Station	Date			Gross Beta Activity pCi/meter <sup>3</sup>
		Start		Stop	
1 <sup>1</sup>	PSP-A-1	12/27/16	-	01/03/17	0.03 +/- 0.004
2 <sup>2</sup>	PSP-A-1	01/03/17	-	01/09/17	
3	PSP-A-1	01/09/17	-	01/17/17	0.03 +/- 0.004
4 <sup>3</sup>	PSP-A-1	01/17/17	-	01/23/17	0.02 +/- 0.004
5	PSP-A-1	01/23/17	-	01/30/17	0.04 +/- 0.006
6	PSP-A-1	01/30/17	-	02/06/17	0.07 +/- 0.010
7	PSP-A-1	02/06/17	-	02/13/17	0.05 +/- 0.010
8	PSP-A-1	02/13/17	-	02/21/17	0.07 +/- 0.010
9	PSP-A-1	02/21/17	-	02/27/17	0.07 +/- 0.010
10	PSP-A-1	02/27/17	-	03/06/17	0.07 +/- 0.010
11	PSP-A-1	03/06/17	-	03/13/17	0.09 +/- 0.013
12	PSP-A-1	03/13/17	-	03/20/17	0.05 +/- 0.007
13	PSP-A-1	03/20/17	-	03/27/17	0.06 +/- 0.008
14	PSP-A-1	03/27/17	-	04/03/17	0.04 +/- 0.007
15	PSP-A-1	04/03/17	-	04/10/17	0.07 +/- 0.010
16	PSP-A-1	04/10/17	-	04/17/17	0.05 +/- 0.010
17	PSP-A-1	04/17/17	-	04/24/17	0.02 +/- 0.004
18	PSP-A-1	04/24/17	-	05/01/17	0.04 +/- 0.01

<sup>1</sup> Due to the holidays, 12/26 and 01/02, air sample collection day was adjusted.

<sup>2</sup> Due the snow day 01/09 and holidays 01/13 & 01/16, air sample collection was extended to 2 weeks.

<sup>3</sup> Due to the holiday, 01/16, air sample collection was for six days.

# Virginia Department of Health

## AIR PARTICULATE

January 1, 2017 through December 31, 2017

### Pocahontas – PSP-A-1

Pocahontas State Park - Control

Week #	Station	Date			Gross Beta Activity pCi/meter <sup>3</sup>
		Start		Stop	
19	PSP-A-1	05/01/17	-	05/08/17	0.04 +/- 0.010
20	PSP-A-1	05/08/17	-	05/15/17	0.04 +/- 0.006
21	PSP-A-1	05/15/17	-	05/22/17	0.05 +/- 0.010
22	PSP-A-1	05/22/17	-	05/30/17	0.03 +/- 0.004
23	PSP-A-1	05/30/17	-	06/05/17	0.07 +/- 0.010
24 <sup>4</sup>	PSP-A-1	06/05/17	-	06/12/17	0.09 +/- 0.010
25 <sup>5</sup>	PSP-A-1	06/12/17	-	06/19/17	0.04 +/- 0.010
26	PSP-A-1	06/19/17	-	06/26/17	0.07 +/- 0.010
27 <sup>6</sup>	PSP-A-1	06/26/17	-	07/03/17	
28 <sup>7</sup>	PSP-A-1	07/03/17	-	07/10/17	0.05 +/- 0.010
29	PSP-A-1	07/10/17	-	07/17/17	0.08 +/- 0.010
30 <sup>8</sup>	PSP-A-1	07/17/17	-	07/24/17	
31 <sup>9</sup>	PSP-A-1	07/24/17	-	07/31/17	0.06 +/- 0.010
32	PSP-A-1	07/31/17	-	08/07/17	0.07 +/- 0.010
33	PSP-A-1	08/07/17	-	08/14/17	0.09 +/- 0.010
34	PSP-A-1	08/14/17	-	08/21/17	0.07 +/- 0.010
35	PSP-A-1	08/21/17	-	08/28/17	0.09 +/- 0.010
36	PSP-A-1	08/28/17	-	09/05/17	0.06 +/- 0.010

<sup>4</sup> Due to the holiday and other scheduling issues, air sample was collected for eight days.

<sup>5</sup> Due to eight-day collection period, week 06/05, this week's air collection was 6 days.

<sup>6</sup> Due to holidays, 07/03 and 07/04, air sample was not collected.

<sup>7</sup> Air sample was collected from 06/26 - 07/10.

<sup>8</sup> Due to Dominion Power's graded exercise, sample was not analyzed.

<sup>9</sup> Air sample was collected from 07/17 - 07/31.

# Virginia Department of Health

## AIR PARTICULATE

January 1, 2017 through December 31, 2017

### Pocahontas – PSP-A-1

Pocahontas State Park – Control

Week #	Station	Date			Gross Beta Activity pCi/meter <sup>3</sup>
		Start		Stop	
37 <sup>10</sup>	PSP-A-1	09/05/17	-	09/11/17	
38 <sup>11</sup>	PSP-A-1	09/11/17	-	09/18/17	0.06 +/- 0.010
39	PSP-A-1	09/18/17	-	09/25/17	0.12 +/- 0.020
40	PSP-A-1	09/25/17	-	10/02/17	0.13 +/- 0.020
41 <sup>12</sup>	PSP-A-1	10/02/17	-	10/09/17	
42 <sup>13</sup>	PSP-A-1	10/09/17	-	10/16/17	0.04 +/- 0.010
43	PSP-A-1	10/16/17	-	10/23/17	0.13 +/- 0.017
44 <sup>14</sup>	PSP-A-1	10/23/17	-	10/30/17	
45 <sup>15</sup>	PSP-A-1	10/30/17	-	11/06/17	0.04 +/- 0.010
46	PSP-A-1	11/06/17	-	11/13/17	0.04 +/- 0.010
47 <sup>16</sup>	PSP-A-1	11/13/17	-	11/20/17	
48 <sup>17</sup>	PSP-A-1	11/20/17	-	11/27/17	0.03 +/- 0.004
49	PSP-A-1	11/27/17	-	12/04/17	0.09 +/- 0.010
50	PSP-A-1	12/04/17	-	12/11/17	0.05 +/- 0.005
51 <sup>18</sup>	PSP-A-1	12/11/17	-	12/18/17	
52 <sup>19</sup>	PSP-A-1	12/18/17	-	12/25/17	
53 <sup>20</sup>	PSP-A-1	12/25/17	-	01/01/18	

<sup>10</sup> Due to holiday and other scheduling issues, air sample was not collected.

<sup>11</sup> Air sample collected from 9/05 – 09/18.

<sup>12</sup> Due to the holiday, air sample was not collected.

<sup>13</sup> Air sample collected from 10/02 – 10/16.

<sup>14</sup> Due to MICL servicing, air sample was not collected.

<sup>15</sup> Air sample collected from 10/23 – 11/06.

<sup>16</sup> Due to Thanksgiving holiday, air sample was not collected.

<sup>17</sup> Due to the prior week holiday, air sample was collected from 11/13 – 11/27.

<sup>18</sup> Due to the MICL needing service, air sample was not collected.

<sup>19</sup> Due to the MICL being serviced and the holiday, samples were not collected.

<sup>20</sup> Due to the MICL being serviced and the holiday, samples were not collected.

# Virginia Department of Health

## AIR PARTICULATE

January 1, 2017 through December 31, 2017

### North Anna Power Station at Route 700 – NAPS-A-1

Louisa County Route 700 / North Anna Power Station

Week #	Station	Date			Gross Beta Activity pCi/meter <sup>3</sup>
		Start		Stop	
1 <sup>1</sup>	NAPS-A-1	12/27/16	-	01/03/17	0.02 +/- 0.004
2 <sup>2</sup>	NAPS-A-1	01/03/17	-	01/09/17	
3	NAPS-A-1	01/09/17	-	01/17/17	0.03 +/- 0.004
4 <sup>3</sup>	NAPS-A-1	01/17/17	-	01/23/17	0.02 +/- 0.004
5	NAPS-A-1	01/23/17	-	01/30/17	0.03 +/- 0.005
6	NAPS-A-1	01/30/17	-	02/06/17	0.06 +/- 0.010
7	NAPS-A-1	02/06/17	-	02/13/17	0.06 +/- 0.010
8	NAPS-A-1	02/13/17	-	02/21/17	0.06 +/- 0.010
9	NAPS-A-1	02/21/17	-	02/27/17	0.07 +/- 0.010
10	NAPS-A-1	02/27/17	-	03/06/17	0.07 +/- 0.010
11	NAPS-A-1	03/06/17	-	03/13/17	0.07 +/- 0.010
12	NAPS-A-1	03/13/17	-	03/20/17	0.04 +/- 0.006
13	NAPS-A-1	03/20/17	-	03/27/17	0.06 +/- 0.008
14	NAPS-A-1	03/27/17	-	04/03/17	0.06 +/- 0.009
15	NAPS-A-1	04/03/17	-	04/10/17	0.05 +/- 0.010
16	NAPS-A-1	04/10/17	-	04/17/17	0.05 +/- 0.010
17	NAPS-A-1	04/17/17	-	04/24/17	0.05 +/- 0.007
18	NAPS-A-1	04/24/17	-	05/01/17	0.04 +/- 0.01

<sup>1</sup> Due to the holidays, 12/26 and 01/02, air sample collection day was adjusted.

<sup>2</sup> Due the snow day 01/09 and holidays, 01/13 & 01/16, the air sample collection was extended to 2 weeks.

<sup>3</sup> Due to the holiday, 01/16, air sample collection was for six days.



# Virginia Department of Health

## AIR PARTICULATE

January 1, 2017 through December 31, 2017

### North Anna Power Station at Route 700 – NAPS-A-1

Louisa County Route 700 / North Anna Power Station

Week #	Station	Date			Gross Beta Activity pCi/meter <sup>3</sup>
		Start		Stop	
19	NAPS-A-1	05/01/17	-	05/08/17	0.04 +/- 0.010
20	NAPS-A-1	05/08/17	-	05/15/17	0.03 +/- 0.005
21	NAPS-A-1	05/15/17	-	05/22/17	0.05 +/- 0.010
22	NAPS-A-1	05/22/17	-	05/30/17	0.03 +/- 0.005
23	NAPS-A-1	05/30/17	-	06/05/17	0.05 +/- 0.010
24 <sup>4</sup>	NAPS-A-1	06/05/17	-	06/12/17	0.08 +/- 0.010
25 <sup>5</sup>	NAPS-A-1	06/12/17	-	06/19/17	
26	NAPS-A-1	06/19/17	-	06/26/17	0.07 +/- 0.010
27 <sup>6</sup>	NAPS-A-1	06/26/17	-	07/03/17	
28 <sup>7</sup>	NAPS-A-1	07/03/17	-	07/10/17	0.06 +/- 0.010
29	NAPS-A-1	07/10/17	-	07/17/17	0.08 +/- 0.010
30 <sup>8</sup>	NAPS-A-1	07/17/17	-	07/24/17	
31 <sup>9</sup>	NAPS-A-1	07/24/17	-	07/31/17	0.07 +/- 0.010
32	NAPS-A-1	07/31/17	-	08/07/17	0.07 +/- 0.010
33	NAPS-A-1	08/07/17	-	08/14/17	0.14 +/- 0.020
34	NAPS-A-1	08/14/17	-	08/21/17	0.08 +/- 0.010
35	NAPS-A-1	08/21/17	-	08/28/17	0.08 +/- 0.010
36	NAPS-A-1	08/28/17	-	09/05/17	0.05 +/- 0.010

<sup>4</sup> Due to scheduling and other issues, air sample was collected for eight days.

<sup>5</sup> Due to tripped circuit breaker, air sampler was not operational.

<sup>6</sup> Due to holidays, 7/3 and 7/4, air sample was not collected.

<sup>7</sup> Air sample was collected from 06/26 – 07/10.

<sup>8</sup> Due to Dominion Power's graded exercise, air sample was not collected.

<sup>9</sup> Air sample was collected from 07/17 – 07/31.

# Virginia Department of Health

## AIR PARTICULATE

January 1, 2017 through December 31, 2017

### North Anna Power Station at Route 700 – NAPS-A-1

Louisa County Route 700 / North Anna Power Station

Week #	Station	Date			Gross Beta Activity pCi/meter <sup>3</sup>
		Start		Stop	
37 <sup>10</sup>	NAPS-A-1	09/05/17	-	09/11/17	
38 <sup>11</sup>	NAPS-A-1	09/11/17	-	09/18/17	0.06 +/- 0.010
39	NAPS-A-1	09/18/17	-	09/25/17	0.13 +/- 0.020
40	NAPS-A-1	09/25/17	-	10/02/17	0.11 +/- 0.020
41 <sup>12</sup>	NAPS-A-1	10/02/17	-	10/09/17	
42 <sup>13</sup>	NAPS-A-1	10/09/17	-	10/16/17	0.03 +/- 0.005
43	NAPS-A-1	10/16/17	-	10/23/17	0.09 +/- 0.013
44 <sup>14</sup>	NAPS-A-1	10/23/17	-	10/30/17	
45 <sup>15</sup>	NAPS-A-1	10/30/17	-	11/06/17	0.03 +/- 0.004
46	NAPS-A-1	11/06/17	-	11/13/17	0.05 +/- 0.008
47 <sup>16</sup>	NAPS-A-1	11/13/17	-	11/20/17	
48 <sup>17</sup>	NAPS-A-1	11/20/17	-	11/27/17	0.03 +/- 0.004
49	NAPS-A-1	11/27/17	-	12/04/17	0.00 +/- 0.00
50	NAPS-A-1	12/04/17	-	12/11/17	0.00 +/- 0.00
51 <sup>18</sup>	NAPS-A-1	12/11/17	-	12/18/17	
52 <sup>19</sup>	NAPS-A-1	12/18/17	-	12/25/17	
53 <sup>20</sup>	NAPS-A-1	12/25/17	-	01/01/18	

<sup>10</sup> Due to the holiday and other scheduling issues, air sample was not collected.

<sup>11</sup> Air sample collected from 9/05 – 09/18.

<sup>12</sup> Due to the holiday, air sample was not collected.

<sup>13</sup> Air sample collected from 10/02 – 10/16.

<sup>14</sup> Due to MICL servicing, air sample was not collected.

<sup>15</sup> Air sample collected from 10/23 – 11/06.

<sup>16</sup> Due to Thanksgiving holiday, air sample was not collected.

<sup>17</sup> Air sample was collected from 11/13 – 11/27.

<sup>18</sup> Due to the MICL needing service, air sample was not collected.

<sup>19</sup> Due to the MICL being serviced and the holiday, air sample was not collected.

<sup>20</sup> Due to the MICL being serviced and the holiday, air sample was not collected.

# Virginia Department of Health

## AIR PARTICULATE

January 1, 2017 through December 31, 2017

### Bumpass Fire Station – NAPS-A-2

Louisa County / Bumpass Volunteer Fire Station

Week #	Station	Date		Gross Beta Activity pCi/meter <sup>3</sup>
		Start	Stop	
1 <sup>1</sup>	NAPS-A-2	12/27/16	- 01/03/17	0.02+/-0.003
2 <sup>2</sup>	NAPS-A-2	01/03/17	- 01/09/17	
3	NAPS-A-2	01/09/17	- 01/17/17	0.02 +/- 0.003
4 <sup>3</sup>	NAPS-A-2	01/17/17	- 01/23/17	0.02 +/- 0.003
5	NAPS-A-2	01/23/17	- 01/30/17	0.03 +/- 0.004
6	NAPS-A-2	01/30/17	- 02/06/17	0.06 +/- 0.010
7	NAPS-A-2	02/06/17	- 02/13/17	0.04 +/- 0.010
8	NAPS-A-2	02/13/17	- 02/21/17	0.07 +/- 0.010
9	NAPS-A-2	02/21/17	- 02/27/17	0.07 +/- 0.010
10	NAPS-A-2	02/27/17	- 03/06/17	0.05 +/- 0.008
11	NAPS-A-2	03/06/17	- 03/13/17	0.04 +/- 0.007
12	NAPS-A-2	03/13/17	- 03/20/17	0.03 +/- 0.005
13	NAPS-A-2	03/20/17	- 03/27/17	0.05 +/- 0.006
14	NAPS-A-2	03/27/17	- 04/03/17	0.04 +/- 0.007
15	NAPS-A-2	04/03/17	- 04/10/17	0.05 +/- 0.010
16	NAPS-A-2	04/10/17	- 04/17/17	0.05 +/- 0.010
17	NAPS-A-2	04/17/17	- 04/24/17	0.02 +/- 0.004
18	NAPS-A-2	04/24/17	- 05/01/17	0.03 +/- 0.004

<sup>1</sup> Due to the holidays, 12/26 and 01/02, air sample collection day was adjusted.

<sup>2</sup> Due the snow day 01/09 and holidays, 01/13 & 01/16, the air sample collection was extended to 2 weeks.

<sup>3</sup> Due to the holiday, 01/16, air sample collection was for six days.

# Virginia Department of Health

## AIR PARTICULATE

January 1, 2017 through December 31, 2017

### Bumpass Fire Station – NAPS-A-2

Louisa County / Bumpass Volunteer Fire Station

Week #	Station	Date			Gross Beta Activity pCi/meter <sup>3</sup>
		Start		Stop	
19	NAPS-A-2	05/01/17	-	05/08/17	0.03 +/- 0.005
20	NAPS-A-2	05/08/17	-	05/15/17	0.02 +/- 0.004
21	NAPS-A-2	05/15/17	-	05/22/17	0.03 +/- 0.005
22	NAPS-A-2	05/22/17	-	05/30/17	0.02 +/- 0.003
23	NAPS-A-2	05/30/17	-	06/05/17	0.05 +/- 0.010
24 <sup>4</sup>	NAPS-A-2	06/05/17	-	06/12/17	0.11 +/- 0.010
25 <sup>5</sup>	NAPS-A-2	06/12/17	-	06/19/17	0.03 +/- 0.005
26	NAPS-A-2	06/19/17	-	06/26/17	0.10 +/- 0.010
27 <sup>6</sup>	NAPS-A-2	06/26/17	-	07/03/17	
28 <sup>7</sup>	NAPS-A-2	07/03/17	-	07/10/17	0.06 +/- 0.010
29	NAPS-A-2	07/10/17	-	07/17/17	0.07 +/- 0.010
30 <sup>8</sup>	NAPS-A-2	07/17/17	-	07/24/17	
31 <sup>9</sup>	NAPS-A-2	07/24/17	-	07/31/17	0.08 +/- 0.010
32	NAPS-A-2	07/31/17	-	08/07/17	0.06 +/- 0.010
33	NAPS-A-2	08/07/17	-	08/14/17	0.10 +/- 0.010
34	NAPS-A-2	08/14/17	-	08/21/17	0.08 +/- 0.010
35	NAPS-A-2	08/21/17	-	08/28/17	0.05 +/- 0.010
36	NAPS-A-2	08/28/17	-	09/05/17	0.04 +/- 0.010

<sup>4</sup> Due to scheduling and other issues, air sample was collected for eight days.

<sup>5</sup> Due to eight-day collection period, week 06/05, this week's air collection was 6 days.

<sup>6</sup> Due to holidays, 7/3 and 7/4, air sample was not collected.

<sup>7</sup> Air samples were collected from 06/26 - 07/10.

<sup>8</sup> Due to Dominion Power's graded exercise, air sample was not collected.

<sup>9</sup> Air sample was collected from 07/17 - 07/31.

# Virginia Department of Health

## AIR PARTICULATE

January 1, 2017 through December 31, 2017

### Bumpass Fire Station – NAPS-A-2

Louisa County / Bumpass Volunteer Fire Station

Week #	Station	Date			Gross Beta Activity pCi/meter <sup>3</sup>
		Start		Stop	
37 <sup>10</sup>	NAPS-A-2	09/05/17	-	09/11/17	
38 <sup>11</sup>	NAPS-A-2	09/11/17	-	09/18/17	0.05 +/- 0.010
39	NAPS-A-2	09/18/17	-	09/25/17	0.11 +/- 0.010
40	NAPS-A-2	09/25/17	-	10/02/17	0.13 +/- 0.020
41 <sup>12</sup>	NAPS-A-2	10/02/17	-	10/09/17	
42 <sup>13</sup>	NAPS-A-2	10/09/17	-	10/16/17	0.02 +/- 0.003
43	NAPS-A-2	10/16/17	-	10/23/17	0.08 +/- 0.010
44 <sup>14</sup>	NAPS-A-2	10/23/17	-	10/30/17	
45 <sup>15</sup>	NAPS-A-2	10/30/17	-	11/06/17	0.03 +/- 0.004
46	NAPS-A-2	11/06/17	-	11/13/17	0.04 +/- 0.006
47 <sup>16</sup>	NAPS-A-2	11/13/17	-	11/20/17	
48 <sup>17</sup>	NAPS-A-2	11/20/17	-	11/27/17	0.03 +/- 0.004
49	NAPS-A-2	11/27/17	-	12/04/17	0.00 +/- 0.00
50	NAPS-A-2	12/04/17	-	12/11/17	0.00 +/- 0.00
51 <sup>18</sup>	NAPS-A-2	12/11/17	-	12/18/17	
52 <sup>19</sup>	NAPS-A-2	12/18/17	-	12/25/17	
53 <sup>20</sup>	NAPS-A-2	12/25/17	-	01/01/18	

<sup>10</sup> Due to the holiday and other scheduling issues, air sample was not collected.

<sup>11</sup> Air sample collected from 9/05 - 09/18.

<sup>12</sup> Due to the holiday, air sample was not collected.

<sup>13</sup> Air sample collected from 10/02 - 10/16.

<sup>14</sup> Due to MICL servicing, air sample was not collected.

<sup>15</sup> Air sample collected from 10/23 - 11/06.

<sup>16</sup> Due to Thanksgiving holiday, air sample was not collected.

<sup>17</sup> Air sample collected from 11/13 - 11/27.

<sup>18</sup> Due to the MICL needing service, air sample was not collected.

<sup>19</sup> Due to the MICL being serviced and the holiday, sample was not collected.

<sup>20</sup> Due to the MICL being serviced and the holiday, sample was not collected.

# Virginia Department of Health

## Gamma & Radiogas in Air

January 1, 2017 through December 31, 2017

### Surry Nuclear Power Plant – SPS-A-1

Surry Power Station – on site

Week #	Station	Date			I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>
Start	Ended						
1 <sup>1</sup>	SPS-A-1	12/27/16	-	01/03/17	NDR	NDR	NDR
2 <sup>2</sup>	SPS-A-1	01/03/17	-	01/09/17			
3	SPS-A-1	01/09/17	-	01/17/17	NDR	NDR	NDR
4 <sup>3</sup>	SPS-A-1	01/17/17	-	01/23/17	NDR	NDR	NDR
5	SPS-A-1	01/23/17	-	01/30/17	NDR	NDR	NDR
6	SPS-A-1	01/30/17	-	02/06/17	NDR	NDR	NDR
7	SPS-A-1	02/06/17	-	02/13/17	NDR	NDR	NDR
8	SPS-A-1	02/13/17	-	02/21/17	NDR	NDR	NDR
9	SPS-A-1	02/21/17	-	02/27/17	NDR	NDR	NDR
10	SPS-A-1	02/27/17	-	03/06/17	NDR	NDR	NDR
11	SPS-A-1	03/06/17	-	03/13/17	NDR	NDR	NDR
12	SPS-A-1	03/13/17	-	03/20/17	NDR	NDR	NDR
13	SPS-A-1	03/20/17	-	03/27/17	NDR	NDR	NDR
14	SPS-A-1	03/27/17	-	04/03/17	NDR	NDR	NDR
15	SPS-A-1	04/04/17	-	04/10/17	NDR	NDR	NDR
16	SPS-A-1	04/10/17	-	04/17/17	NDR	NDR	NDR
17 <sup>4</sup>	SPS-A-1	04/17/17	-	04/24/17	NDR	NDR	NDR
18 <sup>5</sup>	SPS-A-1	04/24/17	-	05/01/17	NDR	NDR	NDR

<sup>1</sup> Due to the holidays, 12/26 and 01/02, air sample collection day was adjusted.

<sup>2</sup> Due to the snow day 01/09 and holidays, 01/13 & 01/16, air sample collection was extended to 2 weeks.

<sup>3</sup> Due to the holiday, 01/16, air sample collection was for six days.

<sup>4</sup> Due to an equipment failure, air sample was not collected.

<sup>5</sup> Air sampler ran for 6 days this collection period, due to equipment maintenance.

# Virginia Department of Health

## Gamma & Radiogas in Air

January 1, 2017 through December 31, 2017

### Surry Nuclear Power Plant – SPS-A-1

Surry Power Station – on site

Week #	Station	Date			I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>
Start	Ended						
19	SPS-A-1	05/01/17	-	05/08/17	NDR	NDR	NDR
20	SPS-A-1	05/08/17	-	05/15/17	NDR	NDR	NDR
21	SPS-A-1	05/15/17	-	05/22/17	NDR	NDR	NDR
22	SPS-A-1	05/22/17	-	05/30/17	NDR	NDR	NDR
23	SPS-A-1	05/30/17	-	06/05/17	NDR	NDR	NDR
24 <sup>6</sup>	SPS-A-1	06/05/17	-	06/13/17	NDR	NDR	NDR
25 <sup>7</sup>	SPS-A-1	06/13/17	-	06/19/17	NDR	NDR	NDR
26	SPS-A-1	06/19/17	-	06/26/17	NDR	NDR	NDR
27 <sup>8</sup>	SPS-A-1	06/26/17	-	07/03/17			
28 <sup>9</sup>	SPS-A-1	07/03/17	-	07/10/17	NDR	NDR	NDR
29	SPS-A-1	07/10/17	-	07/17/17	NDR	NDR	NDR
30 <sup>10</sup>	SPS-A-1	07/17/17	-	07/24/17			
31 <sup>11</sup>	SPS-A-1	07/24/17	-	07/31/17	NDR	NDR	NDR
32	SPS-A-1	07/31/17	-	08/07/17	NDR	NDR	NDR
33	SPS-A-1	08/07/17	-	08/14/17	NDR	NDR	NDR
34	SPS-A-1	08/14/17	-	08/21/17	NDR	NDR	NDR
35	SPS-A-1	08/21/17	-	08/28/17	NDR	NDR	NDR
36	SPS-A-1	08/28/17	-	09/05/17	NDR	NDR	NDR

<sup>6</sup> Due to holiday and other scheduling issues, air sample was collected for eight days.

<sup>7</sup> Due to eight-day collection period, week 06/05, this week's air sample collection was 6 days.

<sup>8</sup> Due to holidays, 7/3 and 7/4, air sample was not collected.

<sup>9</sup> Air sample was collected from 06/26 – 07/10.

<sup>10</sup> Due to Dominion Power's graded exercise, air sample was not collected.

<sup>11</sup> Air sample was collected from 07/17 – 07/31.

# Virginia Department of Health

## Gamma & Radiogas in Air

January 1, 2017 through December 31, 2017

### Surry Nuclear Power Plant – SPS-A-1

Surry Power Station – on site

Week #	Station	Date			I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>
Start	Ended						
37 <sup>12</sup>	SPS-A-1	09/05/17	-	09/11/17			
38 <sup>13</sup>	SPS-A-1	09/11/17	-	09/18/17	NDR	NDR	NDR
39	SPS-A-1	09/18/17	-	09/25/17	NDR	NDR	NDR
40	SPS-A-1	09/25/17	-	10/02/17	NDR	NDR	NDR
41 <sup>14</sup>	SPS-A-1	10/02/17	-	10/09/17			
42 <sup>15</sup>	SPS-A-1	10/09/17	-	10/16/17	NDR	NDR	NDR
43	SPS-A-1	10/16/17	-	10/23/17	NDR	NDR	NDR
44 <sup>16</sup>	SPS-A-1	10/23/17	-	10/30/17			
45 <sup>17</sup>	SPS-A-1	10/30/17	-	11/06/17	NDR	NDR	NDR
46	SPS-A-1	11/06/17	-	11/13/17	NDR	NDR	NDR
47 <sup>18</sup>	SPS-A-1	11/13/17	-	11/20/17			
48 <sup>19</sup>	SPS-A-1	11/20/17	-	11/27/17	NDR	NDR	NDR
49	SPS-A-1	11/27/17	-	12/04/17	NDR	NDR	NDR
50	SPS-A-1	12/04/17	-	12/11/17	NDR	NDR	NDR
51 <sup>20</sup>	SPS-A-1	12/11/17	-	12/18/17			
52 <sup>21</sup>	SPS-A-1	12/18/17	-	12/25/17			
53 <sup>22</sup>	SPS-A-1	12/25/17	-	01/01/18			

<sup>12</sup> Due to holiday and scheduling issues, air sample was not collected.

<sup>13</sup> Air sample collected from 9/05 – 09/18.

<sup>14</sup> Due to holiday, air sample was not collected.

<sup>15</sup> Air sample was collected from 10/02 – 10/16.

<sup>16</sup> Due to the MICL servicing, air sample was not collected.

<sup>17</sup> Air sample collected from 10/23 – 11/06.

<sup>18</sup> Due to Thanksgiving holiday, air sample was not collected.

<sup>19</sup> Air sample was collected from 11/13 – 11/27.

<sup>20</sup> Due to the MICL needing service, air sample was not collected.

<sup>21</sup> Due to the MICL being serviced and the holiday, air sample was not collected.

<sup>22</sup> Due to the MICL being serviced and the holiday, air sample was not collected.



# Virginia Department of Health

## Gamma & Radiogas in Air

January 1, 2017 through December 31, 2017

### Jamestown – SPS-A-2

Jamestown State Park & Historic Site

Week #	Station	Date			I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>
		Start		Ended			
1 <sup>1</sup>	SPS-A-2	12/27/16	-	01/03/17	NDR	NDR	NDR
2 <sup>2</sup>	SPS-A-2	01/03/17	-	01/09/17			
3	SPS-A-2	01/09/17	-	01/17/17	NDR	NDR	NDR
4 <sup>3</sup>	SPS-A-2	01/17/17	-	01/23/17	NDR	NDR	NDR
5	SPS-A-2	01/23/17	-	01/30/17	NDR	NDR	NDR
6	SPS-A-2	01/30/17	-	02/06/17	NDR	NDR	NDR
7	SPS-A-2	02/06/17	-	02/13/17	NDR	NDR	NDR
8	SPS-A-2	02/13/17	-	02/21/17	NDR	NDR	NDR
9	SPS-A-2	02/21/17	-	02/27/17	NDR	NDR	NDR
10	SPS-A-2	02/27/17	-	03/06/17	NDR	NDR	NDR
11	SPS-A-2	03/06/17	-	03/13/17	NDR	NDR	NDR
12	SPS-A-2	03/13/17	-	03/20/17	NDR	NDR	NDR
13	SPS-A-2	03/20/17	-	03/27/17	NDR	NDR	NDR
14	SPS-A-2	03/27/17	-	04/03/17	NDR	NDR	NDR
15	SPS-A-2	04/04/17	-	04/10/17	NDR	NDR	NDR
16	SPS-A-2	04/10/17	-	04/17/17	NDR	NDR	NDR
17	SPS-A-2	04/17/17	-	04/24/17	NDR	NDR	NDR
18	SPS-A-2	04/24/17	-	05/01/17	NDR	NDR	NDR

<sup>1</sup> Due to the holidays, 12/26 and 01/02, air sample collection day was adjusted.

<sup>2</sup> Due the snow day 01/09 and holidays, 01/13 & 01/16, air sample collection was extended to 2 weeks.

<sup>3</sup> Due to the holiday, 01/16, air sample collection was for six days.

# Virginia Department of Health

## Gamma & Radiogas in Air

January 1, 2017 through December 31, 2017

### Jamestown – SPS-A-2

#### Jamestown State Park & Historic Site

Week #	Station	Date			I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>
		Start		Ended			
19	SPS-A-2	05/01/17	-	05/08/17	NDR	NDR	NDR
20	SPS-A-2	05/08/17	-	05/15/17	NDR	NDR	NDR
21	SPS-A-2	05/15/17	-	05/22/17	NDR	NDR	NDR
22	SPS-A-2	05/22/17	-	05/30/17	NDR	NDR	NDR
23	SPS-A-2	05/30/17	-	06/05/17	NDR	NDR	NDR
24 <sup>4</sup>	SPS-A-2	06/05/17	-	06/13/17	NDR	NDR	NDR
25 <sup>5</sup>	SPS-A-2	06/13/17	-	06/19/17	NDR	NDR	NDR
26	SPS-A-2	06/19/17	-	06/26/17	NDR	NDR	NDR
27 <sup>6</sup>	SPS-A-2	06/26/17	-	07/03/17			
28 <sup>7</sup>	SPS-A-2	07/03/17	-	07/10/17	NDR	NDR	NDR
29	SPS-A-2	07/10/17	-	07/17/17	NDR	NDR	NDR
30 <sup>8</sup>	SPS-A-2	07/17/17	-	07/24/17			
31 <sup>9</sup>	SPS-A-2	07/24/17	-	07/31/17	NDR	NDR	NDR
32	SPS-A-2	07/31/17	-	08/07/17	NDR	NDR	NDR
33	SPS-A-2	08/07/17	-	08/14/17	NDR	NDR	NDR
34	SPS-A-2	08/14/17	-	08/21/17	NDR	NDR	NDR
35	SPS-A-2	08/21/17	-	08/28/17	NDR	NDR	NDR
36	SPS-A-2	08/28/17	-	09/05/17	NDR	NDR	NDR

<sup>4</sup> Due to the holiday and scheduling issues, air sample was collected for eight days.

<sup>5</sup> Due to eight-day collection period, week 06/05, the week's air sample collection was 6 days.

<sup>6</sup> Due to holiday's, 07/03 and 07/04, air sample was not collected.

<sup>7</sup> Air sample was collected from 06/26 - 07/10.

<sup>8</sup> Due to Dominion Power's graded exercise, air sample was not collected.

<sup>9</sup> Air sample was collected from 07/17 - 07/31.

# Virginia Department of Health

## Gamma & Radiogas in Air

January 1, 2017 through December 31, 2017

### Jamestown – SPS-A-2

#### Jamestown State Park & Historic Site

Week #	Station	Date			I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>
Start	Ended						
37 <sup>10</sup>	SPS-A-2	09/05/17	-	09/11/17			
38 <sup>11</sup>	SPS-A-2	09/11/17	-	09/18/17	NDR	NDR	NDR
39	SPS-A-2	09/18/17	-	09/25/17	NDR	NDR	NDR
40	SPS-A-2	09/25/17	-	10/02/17	NDR	NDR	NDR
41 <sup>12</sup>	SPS-A-2	10/02/17	-	10/09/17			
42 <sup>13</sup>	SPS-A-2	10/09/17	-	10/16/17	NDR	NDR	NDR
43	SPS-A-2	10/16/17	-	10/23/17	NDR	NDR	NDR
44 <sup>14</sup>	SPS-A-2	10/23/17	-	10/30/17			
45 <sup>15</sup>	SPS-A-2	10/30/17	-	11/06/17	NDR	NDR	NDR
46	SPS-A-2	11/06/17	-	11/13/17	NDR	NDR	NDR
47 <sup>16</sup>	SPS-A-2	11/13/17	-	11/20/17			
48 <sup>17</sup>	SPS-A-2	11/20/17	-	11/27/17	NDR	NDR	NDR
49	SPS-A-2	11/27/17	-	12/04/17	NDR	NDR	NDR
50	SPS-A-2	12/04/17	-	12/11/17	NDR	NDR	NDR
51 <sup>18</sup>	SPS-A-2	12/11/17	-	12/18/17			
52 <sup>19</sup>	SPS-A-2	12/18/17	-	12/25/17			
53 <sup>20</sup>	SPS-A-2	12/25/17	-	01/01/18			

<sup>10</sup> Due to holiday and other scheduling issues, air sample was not collected.

<sup>11</sup> Air sample collected from 9/05 - 09/18.

<sup>12</sup> Due to the holiday, air sample was not collected.

<sup>13</sup> Air sample was collected from 10/02 - 10/16.

<sup>14</sup> Due to MICL servicing, air sample was not collected.

<sup>15</sup> Air sample collected from 10/23 - 11/06.

<sup>16</sup> Due to Thanksgiving holiday, air sample was not collected.

<sup>17</sup> Air sample was collected from 11/13 - 11/27.

<sup>18</sup> Due to the MICL needing service, air sample was not collected.

<sup>19</sup> Due to the MICL being serviced and the holiday, air sample was not collected.

<sup>20</sup> Due to the MICL being serviced and the holiday, air sample was not collected.

# Virginia Department of Health

## Gamma & Radiogas in Air

January 1, 2017 through December 31, 2017

### Pocahontas – PSP-A-1

Pocahontas State Park - Control

Week #	Station	Date			I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>
		Start		Ended			
1 <sup>1</sup>	PSP-A-1	12/27/16	-	01/03/17	NDR	NDR	NDR
2 <sup>2</sup>	PSP-A-1	01/03/17	-	01/09/17			
3	PSP-A-1	01/09/17	-	01/17/17	NDR	NDR	NDR
4 <sup>3</sup>	PSP-A-1	01/17/17	-	01/23/17	NDR	NDR	NDR
5	PSP-A-1	01/23/17	-	01/30/17	NDR	NDR	NDR
6	PSP-A-1	01/30/17	-	02/06/17	NDR	NDR	NDR
7	PSP-A-1	02/06/17	-	02/13/17	NDR	NDR	NDR
8	PSP-A-1	02/13/17	-	02/21/17	NDR	NDR	NDR
9	PSP-A-1	02/21/17	-	02/27/17	NDR	NDR	NDR
10	PSP-A-1	02/27/17	-	03/06/17	NDR	NDR	NDR
11	PSP-A-1	03/06/17	-	03/13/17	NDR	NDR	NDR
12	PSP-A-1	03/13/17	-	03/20/17	NDR	NDR	NDR
13	PSP-A-1	03/20/17	-	03/27/17	NDR	NDR	NDR
14	PSP-A-1	03/27/17	-	04/03/17	NDR	NDR	NDR
15	PSP-A-1	04/04/17	-	04/10/17	NDR	NDR	NDR
16	PSP-A-1	04/10/17	-	04/17/17	NDR	NDR	NDR
17	PSP-A-1	04/17/17	-	04/24/17	NDR	NDR	NDR
18	PSP-A-1	04/24/17	-	05/01/17	NDR	NDR	NDR

<sup>1</sup> Due to the holidays, 12/26 and 01/02, air sample collection day was adjusted.

<sup>2</sup> Due the snow day 01/09 and holidays, 01/13 & 01/16, air sample collection was extended to 2 weeks.

<sup>3</sup> Due to the holiday, 01/16, air sample collection was for six days.

# Virginia Department of Health

## Gamma & Radiogas in Air

January 1, 2017 through December 31, 2017

### Pocahontas – PSP-A-1

#### Pocahontas State Park - Control

Week #	Station	Date			I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>
Start	Ended						
19	PSP-A-1	05/01/17	-	05/08/17	NDR	NDR	NDR
20	PSP-A-1	05/08/17	-	05/15/17	NDR	NDR	NDR
21	PSP-A-1	05/15/17	-	05/22/17	NDR	NDR	NDR
22	PSP-A-1	05/22/17	-	05/30/17	NDR	NDR	NDR
23	PSP-A-1	05/30/17	-	06/05/17	NDR	NDR	NDR
24 <sup>4</sup>	PSP-A-1	06/05/17	-	06/12/17	NDR	NDR	NDR
25 <sup>5</sup>	PSP-A-1	06/12/17	-	06/19/17	NDR	NDR	NDR
26	PSP-A-1	06/19/17	-	06/26/17	NDR	NDR	NDR
27 <sup>6</sup>	PSP-A-1	06/26/17	-	07/03/17			
28 <sup>7</sup>	PSP-A-1	07/03/17	-	07/10/17	NDR	NDR	NDR
29	PSP-A-1	07/10/17	-	07/17/17	NDR	NDR	NDR
30 <sup>8</sup>	PSP-A-1	07/17/17	-	07/24/17			
31 <sup>9</sup>	PSP-A-1	07/24/17	-	07/31/17	NDR	NDR	NDR
32	PSP-A-1	07/31/17	-	08/07/17	NDR	NDR	NDR
33	PSP-A-1	08/07/17	-	08/14/17	NDR	NDR	NDR
34	PSP-A-1	08/14/17	-	08/21/17	NDR	NDR	NDR
35	PSP-A-1	08/21/17	-	08/28/17	NDR	NDR	NDR
36	PSP-A-1	08/28/17	-	09/05/17	NDR	NDR	NDR

<sup>4</sup> Due to the holiday and other scheduling issues, air sample was collected for eight days.

<sup>5</sup> Due to eight-day collection period, week 06/05, this week's air collection was 6 days.

<sup>6</sup> Due to the holidays, 07/03 and 07/04, air sample was not collected.

<sup>7</sup> Air sample was collected from 06/26 - 07/10.

<sup>8</sup> Due to Dominion Power's graded exercise, air sample was not collected.

<sup>9</sup> Air sample was collected from 07/17 - 07/31.

# Virginia Department of Health

## Gamma & Radiogas in Air

January 1, 2017 through December 31, 2017

### Pocahontas – PSP-A-1

#### Pocahontas State Park - Control

Week #	Station	Date			I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>
Start	Ended						
37 <sup>10</sup>	PSP-A-1	09/05/17	-	09/11/17			
38 <sup>11</sup>	PSP-A-1	09/11/17	-	09/18/17	NDR	NDR	NDR
39	PSP-A-1	09/18/17	-	09/25/17	NDR	NDR	NDR
40	PSP-A-1	09/25/17	-	10/02/17	NDR	NDR	NDR
41 <sup>12</sup>	PSP-A-1	10/02/17	-	10/09/17			
42 <sup>13</sup>	PSP-A-1	10/09/17	-	10/16/17	NDR	NDR	NDR
43	PSP-A-1	10/16/17	-	10/23/17	NDR	NDR	NDR
44 <sup>14</sup>	PSP-A-1	10/23/17	-	10/30/17			
45 <sup>15</sup>	PSP-A-1	10/30/17	-	11/06/17	NDR	NDR	NDR
46	PSP-A-1	11/06/17	-	11/13/17	NDR	NDR	NDR
47 <sup>16</sup>	PSP-A-1	11/13/17	-	11/20/17			
48 <sup>17</sup>	PSP-A-1	11/20/17	-	11/27/17	NDR	NDR	NDR
49	PSP-A-1	11/27/17	-	12/04/17	NDR	NDR	NDR
50	PSP-A-1	12/04/17	-	12/11/17	NDR	NDR	NDR
51 <sup>18</sup>	PSP-A-1	12/11/17	-	12/18/17			
52 <sup>19</sup>	PSP-A-1	12/18/17	-	12/25/17			
53 <sup>20</sup>	PSP-A-1	12/25/17	-	01/01/18			

<sup>10</sup> Due to the holiday and other scheduling issues, air sample was not collected.

<sup>11</sup> Air sample collected from 9/05 - 09/18.

<sup>12</sup> Due to the holiday, air sample was not collected.

<sup>13</sup> Air sample collected from 10/02 - 10/16.

<sup>14</sup> Due to MICL servicing, air sample was not collected.

<sup>15</sup> Air sample collected from 10/23 - 11/06.

<sup>16</sup> Due to Thanksgiving holiday, air sample was not collected.

<sup>17</sup> Due to the prior week holiday, air sample was collected from 11/13 - 11/27.

<sup>18</sup> Due to the MICL needing service, air sample was not collected.

<sup>19</sup> Due to the MICL being serviced and the holiday, sample was not collected.

<sup>20</sup> Due to the MICL being serviced and the holiday, sample was not collected.

# Virginia Department of Health

## Gamma & Radiogas in Air

January 1, 2017 through December 31, 2017

### North Anna Power Station at Route 700 – NAPS-A-1

Louisa County Route 700 / North Anna Power Station

Week #	Station	Date			I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>
		Start		Ended			
1 <sup>1</sup>	NAPS-A-1	12/27/16	-	01/03/17	NDR	NDR	NDR
2 <sup>2</sup>	NAPS-A-1	01/03/17	-	01/09/17			
3	NAPS-A-1	01/09/17	-	01/17/17	NDR	NDR	NDR
4 <sup>3</sup>	NAPS-A-1	01/17/17	-	01/23/17	NDR	NDR	NDR
5	NAPS-A-1	01/23/17	-	01/30/17	NDR	NDR	NDR
6	NAPS-A-1	01/30/17	-	02/06/17	NDR	NDR	NDR
7	NAPS-A-1	02/06/17	-	02/13/17	NDR	NDR	NDR
8	NAPS-A-1	02/13/17	-	02/21/17	NDR	NDR	NDR
9	NAPS-A-1	02/21/17	-	02/27/17	NDR	NDR	NDR
10	NAPS-A-1	02/27/17	-	03/06/17	NDR	NDR	NDR
11	NAPS-A-1	03/06/17	-	03/13/17	NDR	NDR	NDR
12	NAPS-A-1	03/13/17	-	03/20/17	NDR	NDR	NDR
13	NAPS-A-1	03/20/17	-	03/27/17	NDR	NDR	NDR
14	NAPS-A-1	03/27/17	-	04/03/17	NDR	NDR	NDR
15	NAPS-A-1	04/04/17	-	04/10/17	NDR	NDR	NDR
16	NAPS-A-1	04/10/17	-	04/17/17	NDR	NDR	NDR
17	NAPS-A-1	04/17/17	-	04/24/17	NDR	NDR	NDR
18	NAPS-A-1	04/24/17	-	05/01/17	NDR	NDR	NDR

<sup>1</sup> Due to the holidays, 12/26 and 01/02, air sample collection day was adjusted.

<sup>2</sup> Due the snow day 01/09 and holidays, 01/13 & 01/16, air sample collection was extended to 2 weeks.

<sup>3</sup> Due to the holiday, 01/16, air sample collection was for six days.

# Virginia Department of Health

## Gamma & Radiogas in Air

January 1, 2017 through December 31, 2017

### North Anna Power Station at Route 700 – NAPS-A-1

Louisa County Route 700 / North Anna Power Station

Week #	Station	Date			I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>
		Start		Ended			
19	NAPS-A-1	05/01/17	-	05/08/17	NDR	NDR	NDR
20	NAPS-A-1	05/08/17	-	05/15/17	NDR	NDR	NDR
21	NAPS-A-1	05/15/17	-	05/22/17	NDR	NDR	NDR
22	NAPS-A-1	05/22/17	-	05/30/17	NDR	NDR	NDR
23	NAPS-A-1	05/30/17	-	06/05/17	NDR	NDR	NDR
24 <sup>4</sup>	NAPS-A-1	06/05/17	-	06/12/17	NDR	NDR	NDR
25 <sup>5</sup>	NAPS-A-1	06/12/17	-	06/19/17	NDR	NDR	NDR
26	NAPS-A-1	06/19/17	-	06/26/17	NDR	NDR	NDR
27 <sup>6</sup>	NAPS-A-1	06/26/17	-	07/03/17			
28 <sup>7</sup>	NAPS-A-1	07/03/17	-	07/10/17	NDR	NDR	NDR
29	NAPS-A-1	07/10/17	-	07/17/17	NDR	NDR	NDR
30 <sup>8</sup>	NAPS-A-1	07/17/17	-	07/24/17			
31 <sup>9</sup>	NAPS-A-1	07/24/17	-	07/31/17	NDR	NDR	NDR
32	NAPS-A-1	07/31/17	-	08/07/17	NDR	NDR	NDR
33	NAPS-A-1	08/07/17	-	08/14/17	NDR	NDR	NDR
34	NAPS-A-1	08/14/17	-	08/21/17	NDR	NDR	NDR
35	NAPS-A-1	08/21/17	-	08/28/17	NDR	NDR	NDR
36	NAPS-A-1	08/28/17	-	09/05/17	NDR	NDR	NDR

<sup>4</sup> Due to the holiday and other scheduling issues, air sample was collected for eight days.

<sup>5</sup> Due to tripped circuit breaker, air sampler was not operational.

<sup>6</sup> Due to holidays, 07/03 and 07/04, air sample was not collected.

<sup>7</sup> Due to the prior holiday week, air sample was collected from 06/26 – 07/10.

<sup>8</sup> Due to Dominion Power's graded exercise, air sample was not collected.

<sup>9</sup> Air sample was collected from 07/17 – 07/31.



# Virginia Department of Health

## Gamma & Radiogas in Air

January 1, 2017 through December 31, 2017

### North Anna Power Station at Route 700 – NAPS-A-1

Louisa County Route 700 / North Anna Power Station

Week #	Station	Date			I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>
Start	Ended						
37 <sup>10</sup>	NAPS-A-1	09/05/17	-	09/11/17			
38 <sup>11</sup>	NAPS-A-1	09/11/17	-	09/18/17	NDR	NDR	NDR
39	NAPS-A-1	09/18/17	-	09/25/17	NDR	NDR	NDR
40	NAPS-A-1	09/25/17	-	10/02/17	NDR	NDR	NDR
41 <sup>12</sup>	NAPS-A-1	10/02/17	-	10/09/17			
42 <sup>13</sup>	NAPS-A-1	10/09/17	-	10/16/17	NDR	NDR	NDR
43	NAPS-A-1	10/16/17	-	10/23/17	NDR	NDR	NDR
44 <sup>14</sup>	NAPS-A-1	10/23/17	-	10/30/17			
45 <sup>15</sup>	NAPS-A-1	10/30/17	-	11/06/17	NDR	NDR	NDR
46	NAPS-A-1	11/06/17	-	11/13/17	NDR	NDR	NDR
47 <sup>16</sup>	NAPS-A-1	11/13/17	-	11/20/17			
48 <sup>17</sup>	NAPS-A-1	11/20/17	-	11/27/17	NDR	NDR	NDR
49	NAPS-A-1	11/27/17	-	12/04/17	NDR	NDR	NDR
50	NAPS-A-1	12/04/17	-	12/11/17	NDR	NDR	NDR
51 <sup>18</sup>	NAPS-A-1	12/11/17	-	12/18/17			
52 <sup>19</sup>	NAPS-A-1	12/18/17	-	12/25/17			
53 <sup>20</sup>	NAPS-A-1	12/25/17	-	01/01/18			

<sup>10</sup> Due to the holiday and other scheduling issues, air sample was not collected.

<sup>11</sup> Air sample collected from 9/05 – 09/18.

<sup>12</sup> Due to the holiday, air sample was not collected.

<sup>13</sup> Air sample collected from 10/02 – 10/16.

<sup>14</sup> Due to MICL servicing, air sample was not collected.

<sup>15</sup> Air sample collected from 10/23 – 11/06.

<sup>16</sup> Due to Thanksgiving holiday, air sample was not collected.

<sup>17</sup> Air sample was collected from 11/13 – 11/27.

<sup>18</sup> Due to the MICL needing service, air sample was not collected.

<sup>19</sup> Due to the MICL being serviced and the holiday, air sample was not collected.

<sup>20</sup> Due to the MICL being serviced and the holiday, air sample was not collected.

# Virginia Department of Health

## Gamma & Radiogas in Air

January 1, 2017 through December 31, 2017

### Bumpass Fire Station – NAPS-A-2

Louisa County / Bumpass Volunteer Fire Station

Week #	Station	Date			I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>
		Start		Ended			
1 <sup>1</sup>	NAPS-A-2	12/27/16	-	01/03/17	NDR	NDR	NDR
2 <sup>2</sup>	NAPS-A-2	01/03/17	-	01/09/17			
3	NAPS-A-2	01/09/17	-	01/17/17	NDR	NDR	NDR
4 <sup>3</sup>	NAPS-A-2	01/17/17	-	01/23/17	NDR	NDR	NDR
5	NAPS-A-2	01/23/17	-	01/30/17	NDR	NDR	NDR
6	NAPS-A-2	01/30/17	-	02/06/17	NDR	NDR	NDR
7	NAPS-A-2	02/06/17	-	02/13/17	NDR	NDR	NDR
8	NAPS-A-2	02/13/17	-	02/21/17	NDR	NDR	NDR
9	NAPS-A-2	02/21/17	-	02/27/17	NDR	NDR	NDR
10	NAPS-A-2	02/27/17	-	03/06/17	NDR	NDR	NDR
11	NAPS-A-2	03/06/17	-	03/13/17	NDR	NDR	NDR
12	NAPS-A-2	03/13/17	-	03/20/17	NDR	NDR	NDR
13	NAPS-A-2	03/20/17	-	03/27/17	NDR	NDR	NDR
14	NAPS-A-2	03/27/17	-	04/03/17	NDR	NDR	NDR
15	NAPS-A-2	04/04/17	-	04/10/17	NDR	NDR	NDR
16	NAPS-A-2	04/10/17	-	04/17/17	NDR	NDR	NDR
17	NAPS-A-2	04/17/17	-	04/24/17	NDR	NDR	NDR
18	NAPS-A-2	04/24/17	-	05/01/17	NDR	NDR	NDR

<sup>1</sup> Due to the holidays, 12/26 and 01/02, air sample collection days were adjusted.

<sup>2</sup> Due the snow day 01/09 and holidays, 01/13 & 01/16, air sample collection was extended to 2 weeks.

<sup>3</sup> Due to the holiday, 01/16, air sample collection was for six days.

# Virginia Department of Health

## Gamma & Radiogas in Air

January 1, 2017 through December 31, 2017

### Bumpass Fire Station – NAPS-A-2

Louisa County / Bumpass Volunteer Fire Station

Week #	Station	Date			I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>
		Start		Ended			
19	NAPS-A-2	05/01/17	-	05/08/17	NDR	NDR	NDR
20	NAPS-A-2	05/08/17	-	05/15/17	NDR	NDR	NDR
21	NAPS-A-2	05/15/17	-	05/22/17	NDR	NDR	NDR
22	NAPS-A-2	05/22/17	-	05/30/17	NDR	NDR	NDR
23	NAPS-A-2	05/30/17	-	06/05/17	NDR	NDR	NDR
24 <sup>4</sup>	NAPS-A-2	06/05/17	-	06/12/17	NDR	NDR	NDR
25 <sup>5</sup>	NAPS-A-2	06/12/17	-	06/19/17	NDR	NDR	NDR
26	NAPS-A-2	06/19/17	-	06/26/17	NDR	NDR	NDR
27 <sup>6</sup>	NAPS-A-2	06/26/17	-	07/03/17			
28 <sup>7</sup>	NAPS-A-2	07/03/17	-	07/10/17	NDR	NDR	NDR
29	NAPS-A-2	07/10/17	-	07/17/17	NDR	NDR	NDR
30 <sup>8</sup>	NAPS-A-2	07/17/17	-	07/24/17			
31 <sup>9</sup>	NAPS-A-2	07/24/17	-	07/31/17	NDR	NDR	NDR
32	NAPS-A-2	07/31/17	-	08/07/17	NDR	NDR	NDR
33	NAPS-A-2	08/07/17	-	08/14/17	NDR	NDR	NDR
34	NAPS-A-2	08/14/17	-	08/21/17	NDR	NDR	NDR
35	NAPS-A-2	08/21/17	-	08/28/17	NDR	NDR	NDR
36	NAPS-A-2	08/28/17	-	09/05/17	NDR	NDR	NDR

<sup>4</sup> Due to the holiday and other scheduling issues, air sample was collected for eight days.

<sup>5</sup> Due to eight-day collection period, week 06/05, this week's air collection was 6 days.

<sup>6</sup> Due to the holidays, 07/3 and 7/4, air sample was not collected.

<sup>7</sup> Air sample collected from 06/26 – 07/10.

<sup>8</sup> Due to Dominion Power's graded exercise, air sample was not collected.

<sup>9</sup> Air sample was collected from 07/17 – 07/31.

# Virginia Department of Health

## Gamma & Radiogas in Air

January 1, 2017 through December 31, 2017

### Bumpass Fire Station – NAPS-A-2

Louisa County / Bumpass Volunteer Fire Station

Week #	Station	Date			I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>
Start	Ended						
37 <sup>10</sup>	NAPS-A-2	09/05/17	-	09/11/17			
38 <sup>11</sup>	NAPS-A-2	09/11/17	-	09/18/17	NDR	NDR	NDR
39	NAPS-A-2	09/18/17	-	09/25/17	NDR	NDR	NDR
40	NAPS-A-2	09/25/17	-	10/02/17	NDR	NDR	NDR
41 <sup>12</sup>	NAPS-A-2	10/02/17	-	10/09/17			
42 <sup>13</sup>	NAPS-A-2	10/09/17	-	10/16/17	NDR	NDR	NDR
43	NAPS-A-2	10/16/17	-	10/23/17	NDR	NDR	NDR
44 <sup>14</sup>	NAPS-A-2	10/23/17	-	10/30/17			
45 <sup>15</sup>	NAPS-A-2	10/30/17	-	11/06/17	NDR	NDR	NDR
46	NAPS-A-2	11/06/17	-	11/13/17	NDR	NDR	NDR
47 <sup>16</sup>	NAPS-A-2	11/13/17	-	11/20/17			
48 <sup>17</sup>	NAPS-A-2	11/20/17	-	11/27/17	NDR	NDR	NDR
49	NAPS-A-2	11/27/17	-	12/04/17	NDR	NDR	NDR
50	NAPS-A-2	12/04/17	-	12/11/17	NDR	NDR	NDR
51 <sup>18</sup>	NAPS-A-2	12/11/17	-	12/18/17			
52 <sup>19</sup>	NAPS-A-2	12/18/17	-	12/25/17			
53 <sup>20</sup>	NAPS-A-2	12/25/17	-	01/01/18			

<sup>10</sup> Due to the holiday and other scheduling issues, air sample was not collected.

<sup>11</sup> Air sample collected from 9/05 – 09/18.

<sup>12</sup> Due to the holiday, sample was not collected.

<sup>13</sup> Air sample collected from 10/02 – 10/16.

<sup>14</sup> Due to MICL servicing, air sample was not collected.

<sup>15</sup> Air sample collected from 10/23 – 11/06.

<sup>16</sup> Due to Thanksgiving holiday, sample was not collected.

<sup>17</sup> Air samples were collected from 11/13 – 11/27.

<sup>18</sup> Due to the MICL needing service, air sample was not collected.

<sup>19</sup> Due to the MICL being serviced and the holiday, sample was not collected or analyzed.

<sup>20</sup> Due to the MICL being serviced and the holiday, sample was not collected or analyzed.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### Surry Power Station; Discharge Canal – SPS-W-1

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	Gross Beta	H3 Activity
01/03/17 <sup>1</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		901 +/- 141
01/09/17 <sup>2</sup>												
01/17/17 <sup>3</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 70
01/23/17 <sup>4</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		2703 +/- 254
01/30/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		526 +/- 122
02/06/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 70
02/13/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		601 +/- 122
02/13/17 <sup>D</sup>	<3.0	<3.0	<7.0	<3.0	<7.0	<6.0	<6.0	<3.0	<3.0	<15.0	55.5 +/- 9.9	
02/21/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		826 +/- 140
02/27/17 <sup>5</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		526 +/- 100
03/06/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		1502 +/- 186
03/13/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
03/20/17 <sup>6</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		526 +/- 100
03/27/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		450 +/- 100
04/03/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		1877 +/- 211
04/10/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		450 +/- 100
04/17/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		2703 +/- 254

D=sample analyzed by DCLS

<sup>1</sup> Due to the holiday, 01/02, water sample was collected 01/03.

<sup>2</sup> Due to snow day, 01/09, and the holiday, 01/13, water sample was not collected.

<sup>3</sup> Due to the holiday, 01/16, water grab sample was collected 01/17.

<sup>4</sup> Six-day water sample collection, due to holiday on 01/16.

<sup>5</sup> Water grab sample obtained due to water sampler malfunction.

<sup>6</sup> Water grab sample obtained due to GFR trip, receptacle reset.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### Surry Power Station; Discharge Canal – SPS-W-1

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	Gross Beta	H3 Activity
04/24/17 <sup>7</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		676 +/- 122
05/01/17 <sup>8</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
05/08/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		2102 +/- 222
05/15/17 <sup>9</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4505 +/- 322
05/15/17 <sup>D</sup>	<3.0	<3.0	<7.0	<3.0	<7.0	<6.0	<4.0	<3.0	<3.0	<13.0	9.72 +/- 8.5	
05/22/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		2853 +/- 254
05/30/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 70
06/05/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		75 +/- 70
06/13/17 <sup>10</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		675 +/- 121
06/19/17 <sup>11</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		901 +/- 141
06/26/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		1802 +/- 198
07/03/17 <sup>12</sup>												
07/10/17 <sup>13</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		1126 +/- 157
07/17/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		300 +/- 70
07/24/17 <sup>14</sup>												
07/31/17 <sup>15</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 71

D=sample analyzed by DCLS

<sup>7</sup> Due to GFR being tripped, water grab sample collected for analysis 04/24.

<sup>8</sup> Due to GFR being tripped, water grab sample collected for analysis 05/01.

<sup>9</sup> Elevated Tritium due to SPS performing an outage on one of the units.

<sup>10</sup> Due to scheduling issue, water sample was collected for eight days, week 06/13: Due to water sampler failure, water grab sample was collected 06/13.

<sup>11</sup> Six-day collection, following week 06/13 water sampler reset.

<sup>12</sup> Due to holidays, 7/3 and 7/4, water sample was not collected.

<sup>13</sup> Five-day water sample collection, due to the holidays.

<sup>14</sup> Due to Dominion Power's graded exercise, no water sample was collected.

<sup>15</sup> Due to GRF being tripped, only 16 water sample bottles were collected.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### Surry Power Station; Discharge Canal – SPS-W-1

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	Gross Beta	H3 Activity
08/07/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		901 +/- 141
08/14/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
08/14/17 <sup>D</sup>	<5.0	<5.0	<9.0	<5.0	<11.0	<9.0	<6.0	<5.0	<5.0	<21.0	130.8 +/- 63	
08/21/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 70
08/28/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		901 +/- 141
09/05/17 <sup>16</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
09/11/17 <sup>17</sup>												
09/18/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		676 +/- 122
09/25/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		300 +/- 71
10/02/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 70
10/09/17 <sup>18</sup>												
10/16/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		1426 +/- 187
10/23/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		901 +/- 141
10/30/17 <sup>19</sup>												
11/06/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
11/07/17 <sup>D</sup>	<3.0	<3.0	<7.0	<3.0	< 7.0	<6.0	<6.0	<3.0	<3.0	<16.0	176.6 +/- 51.3	
11/13/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		601 +/- 122

D=sample analyzed by DCLS

<sup>16</sup> Due to GFR being tripped, water grab sample collected for analysis 09/05.

<sup>17</sup> Due to holiday and other scheduling issues, water sample was not collected.

<sup>18</sup> Due to the holiday, water sample was not collected.

<sup>19</sup> Due to MICL servicing, water sample was not collected.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### Surry Power Station; Discharge Canal – SPS-W-1

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs- 134	Cs 137	Ba 140	Gross Beta	H3 Activity
11/20/17 <sup>21</sup>												
11/27/17 <sup>22</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		1802 +/- 200
12/04/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		526 +/- 122
12/11/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 71
12/18/17 <sup>23</sup>												
12/25/17 <sup>24</sup>												
01/01/18 <sup>25</sup>												

D=sample analyzed by DCLS

<sup>21</sup> Due to Thanksgiving holiday, water sample was not collected.

<sup>22</sup> Due to Dominion Power's scheduled release, 11/22, water sample had elevated tritium level.

<sup>23</sup> Due to the MICL needing service, water sample was not collected.

<sup>24</sup> Due to the MICL being serviced and the holiday, water sample was not collected.

<sup>25</sup> Due to the MICL being serviced and the holiday, water sample was not collected.



# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through September 30, 2017

### James River; Robious Landing – SPS-W-2 Surry Control

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs- 134	Cs 137	Ba 140	Gross Beta	H3 Activity
01/03/17 <sup>1</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		751 +/- 122
01/09/17 <sup>2</sup>												
01/17/17 <sup>3</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 70
01/23/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		826 +/- 141
01/30/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		375 +/- 100
02/06/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 70
02/13/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
02/13/17D	<5.0	<5.0	<12.0	<5.0	<11.0	<10.0	<24.0	<5.0	<5.0	<49.0	<24.0	
02/21/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		300 +/- 99
02/27/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 71
03/06/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		75 +/- 223
03/13/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
03/20/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		75 +/- 70
03/27/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 71
04/03/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 70
04/10/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR

D=sample analyzed by DCLS

<sup>1</sup> Due to the holiday, 01/02, water sample was collected 01/03.

<sup>2</sup> Due to snow day, 01/09, and the holiday, 01/13, water sample was not collected.

<sup>3</sup> Due to the holiday, 01/16, water sample was collected 01/17.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### James River; Robious Landing – SPS-W-2

#### Surry Control

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs- 134	Cs 137	Ba 140	Gross Beta	H3 Activity
04/17/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 70
04/24/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 71
05/01/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 70
05/08/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
05/15/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
05/15/17 <sup>D</sup>	<3.0	<3.0	<7.0	<3.0	<7.0	<6.0	<5.0	<3.0	<3.0	<15.0	<14.2	
05/22/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
05/30/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
06/05/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
06/13/17 <sup>4</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		751 +/- 140
06/19/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
06/26/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		751 +/- 121
07/03/17 <sup>5</sup>												
07/10/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 70
07/17/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 70
07/24/17 <sup>6</sup>												
07/31/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
08/07/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		526 +/- 99

D=sample analyzed by DCLS

<sup>4</sup> Due to scheduling issue, Surry's water sample was collected on 06/13.

<sup>5</sup> Due to holidays, 7/3 and 7/4, water sample was not collected.

<sup>6</sup> Due to Dominion Power's graded exercise, water sample was not collected.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### James River; Robious Landing – SPS-W-2

#### Surry Control

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	Gross Beta	H3 Activity
08/14/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
08/14/17 <sup>D</sup>	<5.0	<5.0	<10.0	<5.0	<11.0	<9.0	<7.0	<5.0	<5.0	<23.0	<8.9	
08/21/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		375 +/- 100
08/28/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		75 +/- 223
09/05/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
09/11/17 <sup>7</sup>												
09/18/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		676 +/- 122
09/25/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		75 +/- 122
10/02/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		75 +/- 223
10/09/17 <sup>8</sup>												
10/16/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		601 +/- 122
10/23/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 71
10/30/17 <sup>9</sup>												
11/06/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
11/07/17 <sup>D</sup>	<5.0	<3.0	<7.0	<4.0	<11.0	<9.0	<12.0	<5.0	<6.0	<32.0	<6.9	
11/13/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 71
11/20/17 <sup>11</sup>												
11/27/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		751 +/- 122

D=sample analyzed by DCLS

<sup>7</sup> Due to the holiday and other scheduling issues, water sample was not collected.

<sup>8</sup> Due to the holiday, water sample was not collected.

<sup>9</sup> Due to MICL servicing, water sample was not collected.

<sup>11</sup> Due to Thanksgiving holiday, water sample was not collected.



# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### James River; Scotland Wharf – SPS-W-3

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs- 134	Cs 137	Ba 140	Gross Beta	H3 Activity
01/03/17 <sup>1</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 70
01/09/17 <sup>2</sup>												
01/17/17 <sup>3</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
01/23/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		976 +/- 141
01/30/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		75 +/- 223
02/06/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		375 +/- 70
02/13/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
02/13/17 <sup>D</sup>	<3.0	<3.0	<8.0	<3.0	<8.0	<6.0	<13.0	<3.0	<3.0	<26.0	<13.8	
02/21/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 70
02/27/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		450 +/- 100
03/06/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
03/13/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
03/20/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		300 +/- 70
03/27/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		300 +/- 100
04/03/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		976 +/- 141
04/10/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 70
04/17/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 70
04/24/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		300 +/- 71

D=sample analyzed by DCLS

<sup>1</sup> Due to the holiday, 01/02, water sample was collected 01/03.

<sup>2</sup> Due to snow day, 01/09, and the holiday, 01/13, water sample not collected.

<sup>3</sup> Due to the holiday, 01/16, water sample was collected 01/17.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### James River; Scotland Wharf – SPS-W-3

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs- 134	Cs 137	Ba 140	Gross Beta	H3 Activity
05/01/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		75 +/- 233
05/08/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		826 +/- 140
05/15/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		75 +/- 222
05/15/17 <sup>D</sup>	<5.0	<5.0	<10.0	<5.0	<11.0	<9.0	<7.0	<5.0	<5.0	<24.0	<14.0	
05/22/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
05/30/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
06/05/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
06/13/17 <sup>4</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		450 +/- 99
06/19/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		450 +/- 99
06/26/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		751 +/- 121
07/03/17 <sup>5</sup>												
07/10/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		826 +/- 141
07/17/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 70
07/24/17 <sup>6</sup>												
07/31/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 71
08/07/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		300 +/- 70
08/14/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
08/14/17 <sup>D</sup>	<5.0	<5.0	<10.0	<5.0	<11.0	<9.0	<9.0	<5.0	<5.0	<24.0	96.3 +/-	33.3
08/21/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		751 +/- 122
08/28/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		300 +/- 71

<sup>4</sup> Due to scheduling issue, Surry's water sample was collected on 06/13.

<sup>5</sup> Due to holidays, 7/3 and 7/4, water sample was not collected.

<sup>6</sup> Due to Dominion Power's graded exercise, water sample was not collected.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### James River; Scotland Wharf – SPS-W-3

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs- 134	Cs 137	Ba 140	Gross Beta	H3 Activity
09/05/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
09/11/17 <sup>7</sup>												
09/18/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 70
09/25/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		75 +/- 212
10/02/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 70
10/09/17 <sup>8</sup>												
10/16/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		901 +/- 141
10/23/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
10/30/17 <sup>9</sup>												
11/06/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
11/07/17 <sup>10</sup>	<5.0	<5.0	<10.0	<5.0	<11.0	<9.0	<9.0	<5.0	<5.0	<27.0	105.5 +/- 47	
11/13/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
11/20/17 <sup>11</sup>												
11/27/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		300 +/- 71
12/04/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR

D=sample analyzed by DCLS

<sup>7</sup> Due to the holiday and other scheduling issues, water sample was not collected.<sup>8</sup> Due to holiday, water sample was not collected.<sup>9</sup> Due to MICL servicing, water sample was not collected.<sup>11</sup> Due to Thanksgiving holiday, water sample was not collected.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### James River; Scotland Wharf – SPS-W-3

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs- 134	Cs 137	Ba 140	Gross Beta	H3 Activity
12/11/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 71
12/18/17 <sup>12</sup>												
12/25/17 <sup>13</sup>												
01/01/18 <sup>14</sup>												

<sup>12</sup> Due to the MICL needing service, water sample was not collected.

<sup>13</sup> Due to the MICL being serviced and the holiday, water sample was not collected.

<sup>14</sup> Due to the MICL being serviced and the holiday, water sample was not collected.



# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### North Anna Power Station; Discharge Canal – NAPS-W-1

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs- 134	Cs 137	Ba 140	Gross Beta	H3 Activity
01/03/17 <sup>1</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4354 +/- 322
01/09/17 <sup>2</sup>												
01/17/17 <sup>3</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4880 +/- 345
01/23/17 <sup>4</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		5255 +/- 359
01/30/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4279 +/- 223
02/06/17 <sup>5</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		5556 +/- 356
02/13/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4204 +/- 314
02/13/17D	<3.0	<3.0	<7.0	<3.0	<7.0	<5.0	<4.0	<3.0	<3.0	<13.0	<14.0	
02/21/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4054 +/- 314
02/27/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		5556 +/- 366
03/06/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4730 +/- 338
03/13/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4730 +/- 329
03/20/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		3754 +/- 307
03/27/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4655 +/- 331
04/03/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4655 +/- 337
04/10/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		5105 +/- 345
04/17/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4655 +/- 389

D=sample analyzed by DCLS

<sup>1</sup> Due to the holiday, 01/02, water sample was not collected 01/03.

<sup>2</sup> Due to snow day, 01/09, and the holiday, 01/13, water sample was not collected.

<sup>3</sup> Due to the holiday, 01/16, grab water sample was collected 01/17.

<sup>4</sup> Six-day collection, due to holiday on 01/16.

<sup>5</sup> Due to water sampler malfunction, grab water sample was collected.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### North Anna Power Station; Discharge Canal – NAPS-W-1

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs- 134	Cs 137	Ba 140	Gross Beta	H3 Activity
04/24/17 <sup>6</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		9760 +/- 488
05/01/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4354 +/- 322
05/08/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4730 +/- 344
05/15/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		5030 +/- 344
05/15/17 <sup>D</sup>	<4.0	<5.0	<9.0	<5.0	<11.0	<9.0	<7.0	<5.0	<5.0	<22.0	<13.4	
05/22/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		6381 +/- 380
05/30/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4429 +/- 329
06/05/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4505 +/- 321
06/12/17 <sup>7</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		6006 +/- 371
06/19/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		5856 +/- 365
06/26/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		5931 +/- 370
07/03/17 <sup>8</sup>												
07/10/17 <sup>9</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		5631 +/- 358
07/17/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		3979 +/- 307
07/24/17 <sup>10</sup>												
07/31/17 <sup>11</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		3604 +/- 300
08/07/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		7132 +/- 398

D=sample analyzed by DCLS

<sup>6</sup> Due to Dominion Power's quarterly release, water sample had elevated tritium level.

<sup>7</sup> Due to water sampler equipment malfunction, grab sample was collected.

<sup>8</sup> Due to holidays, 7/3 and 7/4, water sample was not collected.

<sup>9</sup> Automatic water sampler collected water samples for 5 days.

<sup>10</sup> Due to Dominion Power's graded exercise, water sample not collected.

<sup>11</sup> Due to water sampler equipment malfunction, grab water sample was collected.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### North Anna Power Station; Discharge Canal – NAPS-W-1

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs- 134	Cs 137	Ba 140	Gross Beta	H3 Activity
08/14/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		5105 +/- 353
08/14/17 <sup>D</sup>	<3.0	<3.0	<7.0	<3.0	<7.0	<5.0	<5.0	<3.0	<3.0	<15.0	<4.3	
08/21/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		6982 +/- 404
08/28/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		5405 +/- 429
09/05/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		5631 +/- 366
09/11/17 <sup>12</sup>												
09/18/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		8333 +/- 444
09/25/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		6231 +/- 446
10/02/17 <sup>13</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		8784 +/- 456
10/09/17 <sup>14</sup>												
10/16/17 <sup>15</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		8408 +/- 446
10/23/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		5931 +/- 380
10/30/17 <sup>16</sup>												
11/06/17 <sup>17</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		6832 +/- 400
11/07/17 <sup>D</sup>	<5.0	<5.0	<10.0	<11.0	<7.0	<9.0	<11.0	<5.0	<3.0	<30.0	<6.9	
11/13/17 <sup>18</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		7432 +/- 417

D=sample analyzed by DCLS

<sup>12</sup> Due to holiday and scheduling issues, water sample was not collected.

<sup>13</sup> Due to Dominion Power's refueling outage, water sample had an elevated Tritium level.

<sup>14</sup> Due to the holiday, water sample was not collected.

<sup>15</sup> Due to Dominion Power's refueling outage, water sample had an elevated Tritium level.

<sup>16</sup> Due to MICL servicing, water sample was not collected.

<sup>17</sup> Due to Dominion Power's refueling outage, water sample had an elevated Tritium level.

<sup>18</sup> Due to Dominion Power's refueling outage, water sample had an elevated Tritium level.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### North Anna Power Station; Discharge Canal – NAPS-W-1

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs- 134	Cs 137	Ba 140	Gross Beta	H3 Activity
11/20/17 <sup>20</sup>												
11/27/17 <sup>21</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		7432 +/- 417
12/04/17 <sup>22</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		6757 +/- 403
12/11/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		5931 +/- 387
12/18/17 <sup>23</sup>												
12/25/17 <sup>24</sup>												
01/01/18 <sup>25</sup>												

D=sample analyzed by DCLS

<sup>20</sup> Due to Thanksgiving holiday, water sample was not collected.

<sup>21</sup> Due to Dominion Power's scheduled refueling outage, water sample had an elevated tritium level.

<sup>22</sup> Due to 2 of 8 circulating water intake pumps not being in service, water sample had elevated tritium level.

<sup>23</sup> Due to the MICL needing service, water sample was not collected.

<sup>24</sup> Due to the MICL being serviced and the holiday, water sample was not collected.

<sup>25</sup> Due to the MICL being serviced and the holiday, water sample was not collected.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### North Anna River; Route 651 – NAPS-W-2

#### North Anna Control

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs- 134	Cs 137	Ba 140	Gross Beta	H3 Activity
01/03/17 <sup>1</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		375 +/- 99
01/09/17 <sup>2</sup>												
01/17/17 <sup>3</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 70
01/23/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		826 +/- 141
01/30/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 70
02/06/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		300 +/- 70
02/13/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 70
02/13/17 <sup>D</sup>	<3.0	<3.0	<7.0	<3.0	<7.0	<6.0	<7.0	<3.0	<3.0	<18.0	<13.3	
02/21/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 70
02/27/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 71
03/06/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
03/13/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
03/20/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		75 +/- 223
03/27/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 71
04/03/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		601 +/- 122
04/10/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		75 +/- 223

D=sample analyzed by DCLS

<sup>1</sup> Due to the holiday, 01/02, water sample was collected 01/03.

<sup>2</sup> Due to snow day, 01/09, and the holiday, 01/13, water sample was not collected.

<sup>3</sup> Due to the holiday, 01/16, water grab samples were collected 01/17.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### North Anna River; Route 651 – NAPS-W-2

#### North Anna Control

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs- 134	Cs 137	Ba 140	Gross Beta	H3 Activity
04/17/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
04/24/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		75 +/- 71
05/01/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
05/08/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
05/15/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
05/15/17 <sup>D</sup>	<3.0	<3.0	<6.0	<3.0	<7.0	<5.0	<4.0	<3.0	<3.0	<11.0	<13.3	
05/22/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
05/30/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 70
06/05/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
06/12/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		526 +/- 99
06/19/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
06/26/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		300 +/- 70
07/03/17 <sup>4</sup>												
07/10/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 70
07/17/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 70
07/24/17 <sup>5</sup>												
07/31/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		75 +/- 223
08/07/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		450 +/- 99
08/14/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR

D=sample analyzed by DCLS

<sup>4</sup> Due to holidays, 7/3 and 7/4, water sample was not collected.

<sup>5</sup> Due to Dominion Power's graded exercise, water sample was not collected.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### North Anna River; Route 651 – NAPS-W-2

#### North Anna Control

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs- 134	Cs 137	Ba 140	Gross Beta	H3 Activity
08/14/17 <sup>D</sup>	<3.0	<3.0	<7.0	<3.0	<7.0	<5.0	<3.0	<3.0	<3.0	<11.0	<4.6	
08/21/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		676 +/- 122
08/28/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
09/05/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
09/11/17 <sup>6</sup>												
09/18/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		300 +/- 99
09/25/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		75 +/- 212
10/02/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		526 +/- 122
10/09/17 <sup>7</sup>												
10/16/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		300 +/- 100
10/23/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 71
10/30/17 <sup>8</sup>												
11/06/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
11/07/17 <sup>D</sup>	<3.0	<3.0	<7.0	<3.0	<7.0	<6.0	<5.0	<3.0	<3.0	<15.0	<6.9	
11/13/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		75 +/- 0

D=sample analyzed by DCLS

<sup>6</sup> Due to the holiday and other scheduling issues, water sample was not collected.

<sup>7</sup> Due to holiday, water sample was not collected.

<sup>8</sup> Due to MICL servicing, water sample was not collected.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### North Anna River; Route 651 – NAPS-W-2

#### North Anna Control

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs- 134	Cs 137	Ba 140	Gross Beta	H3 Activity
11/20/17 <sup>10</sup>												
11/27/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		75 +/- 223
12/04/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		
12/11/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		75 +/- 234
12/18/17 <sup>11</sup>												
12/25/17 <sup>12</sup>												
01/01/18 <sup>13</sup>												

D=sample analyzed by DCLS

<sup>10</sup> Due to Thanksgiving holiday, water sample was not collected.

<sup>11</sup> Due to the MICL needing service water sample was not collected.

<sup>12</sup> Due to the MICL being serviced and the holiday, water sample was not collected.

<sup>13</sup> Due to the MICL being serviced and the holiday, water sample was not collected.



# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### North Anna River; Route 522 – NAPS-W-3

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs- 134	Cs 137	Ba 140	Gross Beta	H3 Activity
01/03/17 <sup>1</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		901 +/- 157
01/09/17 <sup>2</sup>												
01/17/17 <sup>3</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		526 +/- 100
01/23/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		976 +/- 141
01/30/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		375 +/- 100
02/06/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 70
02/13/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
02/13/17 <sup>D</sup>	<5.0	<5.0	<11.0	<5.0	<11.0	<9.0	<11.0	<5.0	<3.0	<31.0	<14.3	
02/21/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		375 +/- 99
02/27/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
03/06/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		75 +/- 223
03/13/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
03/20/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 70
03/27/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 71
04/03/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		526 +/- 99
04/10/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 70
04/17/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
04/24/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		676 +/- 122

D=sample analyzed by DCLS

<sup>1</sup> Due to the holiday, 01/02, water sample was collected 01/03.

<sup>2</sup> Due to snow day, 01/09, and the holiday, 01/13, water samples was not collected.

<sup>3</sup> Due to the holiday, 01/16, sample water was collected 01/17.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### North Anna River; Route 522 – NAPS-W-3

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs- 134	Cs 137	Ba 140	Gross Beta	H3 Activity
05/01/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		150 +/- 70
05/08/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		225 +/- 70
05/15/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		526 +/- 122
05/15/17 <sup>D</sup>	<5.0	<5.0	<10.0	<5.0	<11.0	<9.0	<9.0	<5.0	<6.0	<27.0	<14.1	
05/22/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		976 +/- 158
05/30/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		1201 +/- 172
06/05/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
06/12/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		2177 +/- 222
06/19/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		1426 +/- 186
06/26/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		2553 +/- 242
07/03/17 <sup>4</sup>												
07/10/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		2252 +/- 233
07/17/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		2553 +/- 244
07/24/17 <sup>5</sup>												
07/31/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		2477 +/- 245
08/07/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		3829 +/- 298
08/14/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		3003 +/- 299
08/14/17 <sup>D</sup>	<3.0	<3.0	<6.0	<3.0	<7.0	<6.0	<4.0	<3.0	<3.0	<13.0	<4.2	
08/21/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4505 +/- 223

D=sample analyzed by DCLS

<sup>4</sup> Due to holidays, 7/3 and 7/4, water sample was not collected.

<sup>5</sup> Due to Dominion Power's graded exercise, water sample was not collected.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### North Anna River; Route 522 – NAPS-W-3

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs- 134	Cs 137	Ba 140	Gross Beta	H3 Activity
08/28/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4054 +/- 331
09/05/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		3153 +/- 273
09/11/17 <sup>6</sup>												
09/18/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4354 +/- 329
09/25/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		5556 +/- 360
10/02/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4279 +/- 330
10/09/17 <sup>7</sup>												
10/16/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4580 +/- 338
10/23/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		5931 +/- 373
10/30/17 <sup>8</sup>												
11/06/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4655 +/- 374
11/07/17 <sup>D</sup>	<3.0	<3.0	<7.0	<3.0	<7.0	<6.0	<7.0	<3.0	<3.0	<17.0	8.1 +/- 4.6	
11/13/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		5255 +/- 345
11/20/17 <sup>10</sup>												
11/27/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		4805 +/- 338
12/04/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		3078 +/- 281

D=sample analyzed by DCLS

<sup>6</sup> Due to the holiday and other scheduling issues, water sample was not collected.

<sup>7</sup> Due to holiday, water sample was not collected.

<sup>8</sup> Due to MICL servicing, water sample was not collected.

<sup>10</sup> Due to Thanksgiving Holiday, water sample was not collected.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### North Anna River; Route 522 – NAPS-W-3

Gamma and Tritium Activity – pCi/Liter

Date	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs- 134	Cs 137	Ba 140	Gross Beta	H3 Activity
12/11/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		3003 +/- 273
12/04/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		3078 +/- 281
12/11/17	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		3003 +/- 273
12/18/17 <sup>11</sup>												
12/25/17 <sup>12</sup>												
01/01/18 <sup>13</sup>												

D=sample analyzed by DCLS

<sup>11</sup> Due to the MICL needing service, water sample was not collected.

<sup>12</sup> Due to the MICL being serviced and the holiday, water sample was not collected.

<sup>13</sup> Due to the MICL being serviced and the holiday, water sample was not collected.

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### Newport News Shipbuilding

James River – Pier 1  
NNSB-W-1

Qtr.	Date collected	Gamma Activity – pCi/liter						Gross Alpha pCi/liter	Gross Beta pCi/liter
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95		
1st	03/21/17	< 44.0	< 6.0	< 20.0	< 5.0	< 12.0	< 10.0	-	175.9 +/- 12
2nd	06/28/17	< 31.0	< 5.0	< 11.0	< 5.0	< 11.0	< 9.0	-	202.8 +/- 43.3
3rd	09/29/17	< 13.0	< 3.0	< 4.0	< 3.0	< 7.0	< 5.0	<292.5	208.3+/- 68.4
4th	11/01/17	< 19.0	< 3.0	< 8.0	< 3.0	< 7.0	< 6.0		222.9+/- 94.7

James River – Shipway #11  
NNSB-W-2

Qtr.	Date collected	Gamma Activity – pCi/liter						Gross Alpha pCi/liter	Gross Beta pCi/liter
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95		
1st	03/21/17	< 32.0	< 3.0	< 19.0	< 3.0	< 7.0	< 7.0	-	167.4 +/- 12.2
2nd	06/28/17	< 24.0	< 3.0	< 10.0	< 3.0	< 8.0	< 6.0	-	172.1 +/- 40
3rd	09/29/17	< 13.0	< 3.0	< 4.0	< 3.0	< 7.0	< 6.0	<249.9	225.2+/- 69.5
4th	11/01/17	< 29.0	< 6.0	< 10.0	< 5.0	< 9.0	< 6.0	<285.0	194.4+/- 93

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### Norfolk Naval Shipyard

Elizabeth River – Dry Dock #4  
Norfolk Naval Shipyard NNSY-W-1

Qtr.	Date Collected	Gamma Activity – pCi/liter						Gross Alpha pCi/liter	Gross Beta pCi/liter
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95		
1st	03/21/17	< 29.0	< 3.0	< 16.0	< 3.0	< 7.0	< 6.0	< 61.4	185.8 ± 12.6
2nd	06/28/17	< 22.0	< 3.0	< 10.0	< 3.0	< 8.0	< 6.0	< 266.6	186.2 ± 40.7
3rd	09/29/17	< 14.0	< 3.0	< 5.0	< 3.0	< 7.0	< 6.0	< 237.0	196.8 ± 51.1
4th	11/01/17	< 15.0	< 3.0	< 5.0	< 3.0	< 7.0	< 6.0	<367.8	196.8+/- 93.2

Elizabeth River – Dry Dock #8  
Norfolk Naval Shipyard NNSY-W-2

Qtr.	Date collected	Gamma Activity – pCi/liter						Gross Alpha pCi/liter	Gross Beta pCi/liter
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95		
1st	03/21/17	< 57.0	< 5.0	< 31.0	< 5.0	< 11.0	< 11.0	< 72.6	53.3 ± 14.6
2nd	06/28/17	< 15.0	< 3.0	< 6.0	< 3.0	< 8.0	< 6.0	< 348.3	204.7 ± 43.9
3rd	09/29/17	< 15.0	< 3.0	< 5.0	< 3.0	< 7.0	< 6.0	< 321.7	183.7 ± 50.3
4th	11/01/17	< 15.0	< 3.0	< 5.0	< 3.0	< 8.0	< 6.0	<285.0	260.8+/- 97

# Virginia Department of Health

## SURFACE WATER

January 1, 2017 through December 31, 2017

### Norfolk Naval Shipyard

Elizabeth River – Wet Slip #1  
Norfolk Naval Shipyard NNSY-W-3

Qtr.	Date collected	Gamma Activity – pCi/liter						Gross Alpha pCi/liter	Gross Beta pCi/liter
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95		
1st	03/21/17	< 59.0	< 6.0	< 32.0	< 5.0	< 12.0	< 11.0	< 51.4	176.9 ± 12
2nd	06/28/17	< 40.0	< 5.0	< 17.0	< 5.0	< 11.0	< 10.0	< 419.2	179.8 ± 41.5
3rd	09/29/17	< 18.0	< 3.0	< 7.0	< 3.0	< 7.0	< 6.0	< 330.6	206.3 ± 51.7
4th	11/01/17	< 77.0	< 5.0	< 50.0	< 5.0	< 12.0	< 11.0	<302.8	239.4+/- 95.7

# Virginia Department of Health

## FISH

January 1, 2017 through December 31, 2017

### Dominion Nuclear Power Station

Location Type of fish	Date Collected	Isotope	pCi/gram
North Anna 2 <sup>nd</sup> Cooling Lagoon	04/19/17	Ba-140	<0.03 pCi/g
		Cs-134	<0.01 pCi/g
		Cs-137	0.01 +/- 0.01 pCi/g
NAPS- F-1 (Fish)		Co-58	<0.01 pCi/g
		Co-60	<0.01 pCi/g
		I-131	<0.02 pCi/g
		Fe-59	<0.01 pCi/g
		Mn-54	<0.01 pCi/g
		Ru-106	<0.03 pCi/g
		Ag-110M	<0.01 pCi/g
		Zn-65	<0.01 pCi/g
		Nb-95	<0.01 pCi/g
Surry Discharge Canal	04/05/17	Ba-140	<0.04 pCi/g
		Cs-134	<0.01 pCi/g
		Cs-137	<0.01 pCi/g
		Co-58	<0.01 pCi/g
		Co-60	<0.01 pCi/g
		I-131	<0.02 pCi/g
		Fe-59	<0.01 pCi/g
		Mn-54	<0.01 pCi/g
		Ru-106	<0.04 pCi/g
		Ag-110M	<0.01 pCi/g
		Zn-65	<0.01 pCi/g
		Nb-95	<0.01 pCi/g

Note: Fish samples collected during the 2<sup>nd</sup> and 4<sup>th</sup> quarter.



# Virginia Department of Health

## FISH

January 1, 2017 through December 31, 2017

### Dominion Nuclear Power Station

Location Type of fish	Date Collected	Isotope	pCi/gram
North Anna 2 <sup>nd</sup> Cooling Lagoon	11/15/17	Ba-140	<0.08 pCi/g
		Cs-134	<0.01 pCi/g
		Cs-137	<0.01+/-0.01 pCi/g
		Co-58	<0.01 pCi/g
		Co-60	<0.01 pCi/g
		I-131	<0.05 pCi/g
		Fe-59	<0.02 pCi/g
		Mn-54	<0.01 pCi/g
		Ru-106	<0.06 pCi/g
		Ag-110M	<0.01 pCi/g
NAPS- F-1 (Fish)		Zn-65	<0.02 pCi/g
		Nb-95	<0.01 pCi/g
Surry Discharge Canal	10/10/17	Ba-140	<0.02 pCi/g
		Cs-134	<0.01 pCi/g
		Cs-137	<0.01 pCi/g
		Co-58	<0.01 pCi/g
		Co-60	<0.01 pCi/g
		I-131	<0.02 pCi/g
		Fe-59	<0.01 pCi/g
		Mn-54	<0.01 pCi/g
		Ru-106	<0.03 pCi/g
		Ag-110M	<0.01 pCi/g
SPS-F-1 (Fish)		Zn-65	<0.01 pCi/g
		Nb-95	<0.01 pCi/g

Note: Fish samples collected during the 2<sup>nd</sup> and 4<sup>th</sup> quarter.

# Virginia Department of Health

## SHELLFISH

January 1, 2017 through December 31, 2017

Location Type of fish	Date Collected	Isotope	pCi/gram
Surry Power Station	04/03/17	Ba-140	<0.02 pCi/g
		Cs-134	<0.01 pCi/g
		Cs-137	<0.01 pCi/g
		Co-58	<0.01 pCi/g
		Co-60	<0.01 pCi/g
SPS-R-1		I-131	<0.01 pCi/g
(Clams and Oysters)		Fe-59	<0.01 pCi/g
		Mn-54	<0.01 pCi/g
		Ru-106	<0.03 pCi/g
		Ag-110M	<0.01 pCi/g
		Zn-65	<0.01 pCi/g
		Nb-95	<0.01 pCi/g

Note: Shellfish are collected annually when available.

# Virginia Department of Health

## SEDIMENT

January 1, 2017 through December 31, 2017

### Surry Power Station Discharge Canal, James River – SPS-S-1

Quarter	Date Collected	Gamma Activity pCi/gram			
		Cs-134	Cs-137	Co-58	Co-60
1 <sup>st</sup>	02/14/17	<0.01 pCi/g	<0.01 pCi/g	<0.01 pCi/g	<0.01 pCi/g
3 <sup>rd</sup>	08/01/17	<0.01 pCi/g	<0.01 pCi/g	<0.01 pCi/g	<0.01 pCi/g

### North Anna Power Waste Treatment NAPS-S-1

Quarter	Date Collected	Gamma Activity pCi/gram			
		Cs-134	Cs-137	Co-58	Co-60
2 <sup>nd</sup>	04/20/17	<0.01 pCi/g	<0.01 pCi/g	<0.01 pCi/g	<0.01 pCi/g
4 <sup>th</sup>	11/15/17	<0.01 pCi/g	0.01+/- 0.01pCi/g	<0.01 pCi/g	<0.01 pCi/g

Note: Sediment samples are collected bi-annually.

# Virginia Department of Health

## SILT

January 1, 2017 through December 31, 2017

### Newport News Shipbuilding

James River – Pier 1

NNSB-S-1

Qtr.	Date Collected	Gamma Activity pCi/gram				Gross Alpha pCi/gram	Gross Beta pCi/gram
		Cs-134	Cs-137	Co-58	Co-60		
1 <sup>st</sup>	03/21/17	-	-	-	-	Sample compromised ~ unable to analyze	
2 <sup>nd</sup>	06/28/17	< 0.01	0.02 ± 0.01	< 0.01	< 0.01	-	27.4 ± 4.8
3 <sup>rd</sup>	09/29/17	< 0.01	< 0.01	< 0.01	< 0.01	<3.8	<7
4 <sup>th</sup>	11/01/17	< 0.01	0.02 ± 0.01	< 0.01	< 0.01	-	22.4 ± 5.5

James River – Shipway 11

NNSB-S-2

Qtr.	Date Collected	Gamma Activity pCi/gram				Gross Alpha pCi/gram	Gross Beta pCi/gram
		Cs-134	Cs-137	Co-58	Co-60		
1 <sup>st</sup>	03/21/17	< 0.01	0.03 ± 0.01	< 0.01	< 0.01	-	28.9 ± 4.5
2 <sup>nd</sup>	06/28/17	< 0.01	0.02 ± 0.01	< 0.01	< 0.01	-	27.0 ± 4.8
3 <sup>rd</sup>	09/29/17	< 0.01	0.01 ± 0.01	< 0.01	< 0.01	9.35 ± 5	17.3 ± 5.2
4 <sup>th</sup>	11/01/17	< 0.01	0.01 ± 0.01	< 0.01	< 0.01	-	18.0 ± 5.2

# Virginia Department of Health

## SILT

January 1, 2017 through December 31, 2017

### Norfolk Naval Shipyard

Elizabeth River Dry Dock #4  
NNSY-S-1

Qtr.	Date Collected	Gamma Activity pCi/gram				Gross Alpha pCi/gram	Gross Beta pCi/gram
		Cs-134	Cs-137	Co-58	Co-60		
1 <sup>st</sup>	03/21/17	< 0.01	0.02 ± 0.01	< 0.01	< 0.01	15.59 ± 7.9	26.3 ± 4.4
2 <sup>nd</sup>	06/28/17	< 0.01	0.02 ± 0.01	< 0.01	< 0.01	<16.1	31.0 ± 5.2
3 <sup>rd</sup>	09/29/17	< 0.01	0.02 ± 0.01	< 0.01	< 0.01	18.79 ± 9	24.7 ± 5.9
4 <sup>th</sup>	11/01/17	< 0.01	0.02 ± 0.01	< 0.01	<0.01	18.49 ± 8.7	28.0 ± 5.7

Elizabeth River Dry Dock #8  
NNSY-S-2

Qtr.	Date Collected	Gamma Activity pCi/gram				Gross Alpha pCi/gram	Gross Beta pCi/gram
		Cs-134	Cs-137	Co-58	Co-60		
1 <sup>st</sup>	03/21/17	< 0.01	0.02 ± 0.01	< 0.01	< 0.01	29.4 ± 4.5	18 ± 7.8
2 <sup>nd</sup>	06/28/17	< 0.01	0.02 ± 0.01	< 0.01	< 0.01	<12.2	27.4 ± 4.8
3 <sup>rd</sup>	09/29/17	< 0.01	0.02 ± 0.01	< 0.01	< 0.01	10.98 ± 7.0	27.0 ± 6.0
4 <sup>th</sup>	11/01/17	< 0.01	0.02 ± 0.01	< 0.01	< 0.01	11.38 ± 6.8	26.0 ± 5.7

# Virginia Department of Health

## SILT

January 1, 2017 through December 31, 2017

### Norfolk Naval Shipyard

Elizabeth River Wet Slip #1  
NNSY-S-3

Qtr.	Date Collected	Gamma Activity pCi/gram				Gross Alpha pCi/gram	Gross Beta pCi/gram
		Cs-134	Cs-137	Co-58	Co-60		
1st	03/21/17	< 0.01	0.03 ± 0.01	< 0.01	< 0.01	< 8.1	18.4 ± 4.0
2nd	06/28/17	< 0.01	0.02 ± 0.01	< 0.01	< 0.01	< 21.2	23.9 ± 4.5
3rd	09/29/17	< 0.01	0.02 ± 0.01	< 0.01	< 0.01	13.25 ± 7.3	22.1 ± 5.5
4th	11/01/17	< 0.01	0.02 ± 0.01	< 0.01	< 0.01	15.91 ± 8.1	22.8 ± 5.4

# Virginia Department of Health

## Milk

January 1, 2017 through December 31, 2017

### Louisa County - Lakeside Dairy NAPS-M-1

1st Quarter Date: 01/26/2017

Isotope	Results - pCi/liter
Ba-140	< 12.0 pCi/L
Cs-134	< 3.0 pCi/L
Cs-137	< 4.0 pCi/L
K-40	1.6 ± 0.1 g/L
I-131	< 3.0 pCi/L
Sr-89	< 4.0 pCi/L
Sr-90	0.79 ± 0.42 pCi/L

### Louisa County - Lakeside Dairy NAPS-M-1

2nd Quarter Date: 04/12/2017

Isotope	Results - pCi/liter
Ba-140	< 11.0 pCi/L
Cs-134	< 3.0 pCi/L
Cs-137	< 3.0 pCi/L
K-40	1.6 ± 0.1 g/L
I-131	< 3.0 pCi/L
Sr-89	< 4.0 pCi/L
Sr-90	< 0.34 pCi/L

# Virginia Department of Health

## Milk

January 1, 2017 through December 31, 2017

### Louisa County - Lakeside Dairy NAPS-M-1

3rd Quarter Date: 07/07/2017

Isotope	Results - pCi/liter
Ba-140	< 22.0 pCi/L
Cs-134	< 5.0 pCi/L
Cs-137	< 5.0 pCi/L
K-40	1.4 ± 0.1 g/L
I-131	< 7.0 pCi/L
Sr-89	< 4.0 pCi/L
Sr-90	0.72 ± 0.43 pCi/L

### Louisa County - Lakeside Dairy NAPS-M-1

4th Quarter Date: 10/10/2017

Isotope	Results - pCi/liter
Ba-140	< 14.0 pCi/L
Cs-134	< 3.0 pCi/L
Cs-137	< 3.0 pCi/L
K-40	1.7 ± 0.1 g/L
I-131	< 4.0 pCi/L
Sr-89	< 4.0 pCi/L
Sr-90	<0.6 pCi/L



# Virginia Department of Health

## Milk

January 1, 2017 through December 31, 2017

### Surry County - Epps Dairy SPS-M-1

1st Quarter Date: 01/26/2017

Isotope	Results - pCi/liter
Ba-140	< 20.0 pCi/L
Cs-134	< 5.0 pCi/L
Cs-137	< 4.0 pCi/L
K-40	1.5 ± 0.1 g/L
I-131	< 5.0 pCi/L
Sr-89	< 4.0 pCi/L
Sr-90	0.85 ± 0.46 pCi/L

### Surry County - Epps Dairy SPS-M-1

2nd Quarter Date: 04/03/2017

Isotope	Results - pCi/liter
Ba-140	< 20.0 pCi/L
Cs-134	< 5.0 pCi/L
Cs-137	< 6.0 pCi/L
K-40	1.6 ± 0.1 g/L
I-131	< 6.0 pCi/L
Sr-89	< 4.0 pCi/L
Sr-90	0.79 ± 0.46 pCi/L

# Virginia Department of Health

## Milk

January 1, 2017 through December 31, 2017

### Surry County - Epps Dairy SPS-M-1

3rd Quarter Date: 07/07/2017

Isotope	Results - pCi/liter
Ba-140	< 13.0 pCi/L
Cs-134	< 3.0 pCi/L
Cs-137	< 4.0 pCi/L
K-40	1.6 ± 0.1 g/L
I-131	< 4.0 pCi/L
Sr-89	< 4.0 pCi/L
Sr-90	1.47 ± 0.43 pCi/L

### Surry County - Epps Dairy SPS-M-1

4th Quarter Date: 10/10/2017

Isotope	Results - pCi/liter
Ba-140	< 12.0 pCi/L
Cs-134	< 3.0 pCi/L
Cs-137	< 4.0 pCi/L
K-40	1.6 ± 0.1 g/L
I-131	< 4.0 pCi/L
Sr-89	< 4.0 pCi/L
Sr-90	<0.6 pCi/L

# Virginia Department of Health

## AMBIENT GAMMA EXPOSURE

January 1, 2017 through March 31, 2017

### FIRST QUARTER REPORT

Location	Station	Net Exposure Rate mR/Std Qtr +/- 2S.D.		
Pocahontas State Park (Control)	D-40	31.30	+/-	11.19
Surry Power Station	D-20	19.06	+/-	8.73
North Anna Power Station	D-35	23.65	+/-	9.73
Surry – Lebanon Baptist Church	D-41	17.36	+/-	8.33
Surry – Lawnes Creek	D-42	20.98	+/-	9.16
Surry – Route 628	D-43	19.66	+/-	8.87
Jamestown – Historical site	D-44	21.16	+/-	9.20
Newport News - Lee Hall	D-45	24.70	+/-	9.94
Louisa County - Mineral	D-50	20.53	+/-	9.06
Louisa County – Wares Crossroads	D-51	20.45	+/-	9.05
Louisa County – Good Hope Church	D-52	22.48	+/-	9.48
Spotsylvania Route 614	D-53	19.58	+/-	8.85
Louisa County – Fred Hall	D-54	19.96	+/-	8.94
Naval Weapons Station – 1	D-73	16.93	+/-	8.23
Newport News – Fort Eustis	D-76	20.69	+/-	9.10
Williamsburg – Busch Gardens	D-77	22.61	+/-	9.51
Williamsburg – Airport	D-78	17.67	+/-	8.41
Surry – Scotland Wharf	D-79	17.40	+/-	8.34
Surry – Bacon’s Castle	D-80	16.84	+/-	8.21
Surry – Alliance	D-81	19.13	+/-	8.75
Surry – Hog Point	D-82	19.01	+/-	8.72
Louisa County – Route 685	D-84	20.42	+/-	9.04
Spotsylvania – Route 713	D-85	20.85	+/-	9.13
Louisa County – Bumpass Fire Dept.	D-86	23.22	+/-	9.64
Spotsylvania – Levy	D-87	21.94	+/-	9.37
Louisa County – Route 700	D-88	22.62	+/-	9.51
Louisa County – Aspen Hill	D-89	26.95	+/-	10.38
Radiological Health	Control 1	12.95	+/-	7.20
Radiological Health	Control 2	13.83	+/-	7.44

# Virginia Department of Health

## AMBIENT GAMMA EXPOSURE

March 31, 2017 through June 30, 2017

### SECOND QUARTER REPORT

Location	Station	Net Exposure Rate mR/Std Qtr +/- 2S.D.		
Jamestown – Historical site	SPS-D-1	27.77	+/-	9.54
Williamsburg – Airport	SPS-D-2	28.46	+/-	10.67
Williamsburg – Busch Gardens	SPS-D-3	32.50	+/-	11.40
Newport News - Lee Hall	SPS-D-4	35.16	+/-	11.86
Naval Weapons Station – 1	SPS-D-5	27.80	+/-	10.54
Newport News – Fort Eustis	SPS-D-6	24.96	+/-	9.99
Surry – Route 628	SPS-D-7	22.40	+/-	9.47
Surry – Lawnes Creek	SPS-D-8	26.96	+/-	10.39
Surry Power Station	SPS-D-9	26.13	+/-	10.22
Surry – Hog Point	SPS-D-10	26.13	+/-	10.22
Surry – Bacon's Castle	SPS-D-11	25.44	+/-	10.09
Surry – Alliance	SPS-D-12	25.99	+/-	10.20
Surry – Scotland Wharf	SPS-D-13	25.28	+/-	10.06
Surry – Lebanon Baptist Church	SPS-D-14	20.29	+/-	9.01
Louisa County - Mineral	NAPS-D-1	31.56	+/-	11.24
Louisa County – Wares Crossroads	NAPS-D-2	22.50	+/-	9.49
Louisa County – Good Hope Church	NAPS-D-3	30.78	+/-	11.10
Spotsylvania – Route 713	NAPS-D-4	25.44	+/-	10.09
Spotsylvania Route 614	NAPS-D-5	28.16	+/-	10.61
Spotsylvania – Levy	NAPS-D-6	32.75	+/-	11.45
Louisa County – Bumpass Fire Dept.	NAPS-D-7	31.99	+/-	11.31
Louisa County – Fred Hall	NAPS-D-8	26.91	+/-	10.37
Louisa County – Aspen Hill	NAPS-D-9	35.05	+/-	11.84
Louisa County – Route 685	NAPS-D-10	33.40	+/-	11.56
Louisa County – Route 700	NAPS-D-11	34.02	+/-	11.66
North Anna Power Station	NAPS-D-12	35.30	+/-	11.88
Pocahontas State Park (Control)	PSP-D-1	41.90	+/-	12.95
Radiological Health	ORH-D-1	12.66	+/-	7.12
Radiological Health	ORH-D-2	14.30	+/-	7.56

# Virginia Department of Health

## AMBIENT GAMMA EXPOSURE

June 30, 2017 through September 30, 2017

### THIRD QUARTER REPORT

Location	Station	Net Exposure Rate mR/Std Qtr +/- 2S.D.		
Jamestown – Historical site	SPS-D-1	35.99	+/-	12.00
Williamsburg – Airport	SPS-D-2	24.74	+/-	9.95
Williamsburg – Busch Gardens	SPS-D-3	36.44	+/-	12.07
Newport News - Lee Hall	SPS-D-4	37.16	+/-	12.19
Naval Weapons Station – 1	SPS-D-5	25.17	+/-	10.03
Newport News – Fort Eustis	SPS-D-6	30.44	+/-	11.03
Surry – Route 628	SPS-D-7	29.39	+/-	10.84
Surry – Lawnes Creek	SPS-D-8	30.56	+/-	11.06
Surry Power Station	SPS-D-9	28.70	+/-	10.71
Surry – Hog Point	SPS-D-10	28.54	+/-	10.68
Surry – Bacon's Castle	SPS-D-11	25.51	+/-	10.10
Surry – Alliance	SPS-D-12	27.74	+/-	10.53
Surry – Scotland Wharf	SPS-D-13	26.23	+/-	10.24
Surry – Lebanon Baptist Church	SPS-D-14	26.66	+/-	10.33
Louisa County - Mineral	NAPS-D-1	30.53	+/-	11.05
Louisa County – Wares Crossroads	NAPS-D-2	30.91	+/-	11.12
Louisa County – Good Hope Church	NAPS-D-3	37.76	+/-	12.29
Spotsylvania – Route 713	NAPS-D-4	30.56	+/-	11.06
Spotsylvania Route 614	NAPS-D-5	30.49	+/-	11.04
Spotsylvania – Levy	NAPS-D-6	36.75	+/-	12.12
Louisa County – Bumpass Fire Dept.	NAPS-D-7	29.93	+/-	10.94
Louisa County – Fred Hall	NAPS-D-8	27.20	+/-	10.43
Louisa County – Aspen Hill	NAPS-D-9	38.43	+/-	12.40
Louisa County – Route 685	NAPS-D-10	29.77	+/-	10.91
Louisa County – Route 700	NAPS-D-11	39.22	+/-	12.53
North Anna Power Station	NAPS-D-12	34.47	+/-	11.74
Pocahontas State Park (Control)	PSP-D-1	48.59	+/-	13.94
Radiological Health	ORH-D-1	15.10	+/-	7.77
Radiological Health	ORH-D-2	15.91	+/-	7.98

# Virginia Department of Health

## AMBIENT GAMMA EXPOSURE

September 30, 2017 through December 31, 2017

### FOURTH QUARTER REPORT

Location	Station	Net Exposure Rate mR/Std Qtr +/- 2S.D.		
Jamestown – Historical site	SPS-D-1	26.65	+/-	10.32
Williamsburg – Airport	SPS-D-2	34.12	+/-	11.68
Williamsburg – Busch Gardens	SPS-D-3	36.66	+/-	12.11
Newport News - Lee Hall	SPS-D-4	42.08	+/-	12.97
Naval Weapons Station – 1	SPS-D-5	34.07	+/-	11.67
Newport News – Fort Eustis	SPS-D-6	32.86	+/-	11.46
Surry – Route 628	SPS-D-7	24.24	+/-	9.85
Surry – Lawnes Creek	SPS-D-8	32.52	+/-	11.40
Surry Power Station	SPS-D-9	30.98	+/-	11.13
Surry – Hog Point	SPS-D-10	31.07	+/-	11.15
Surry – Bacon's Castle	SPS-D-11	30.44	+/-	11.03
Surry – Alliance	SPS-D-12	27.81	+/-	10.55
Surry – Scotland Wharf	SPS-D-13	32.12	+/-	11.33
Surry – Lebanon Baptist Church	SPS-D-14	23.50	+/-	9.69
Louisa County - Mineral	NAPS-D-1	38.88	+/-	12.47
Louisa County – Wares Crossroads	NAPS-D-2	30.44	+/-	11.03
Louisa County – Good Hope Church	NAPS-D-3	37.05	+/-	12.17
Spotsylvania – Route 713	NAPS-D-4	30.45	+/-	11.04
Spotsylvania Route 614	NAPS-D-5	32.68	+/-	11.43
Spotsylvania – Levy	NAPS-D-6	36.62	+/-	12.10
Louisa County – Bumpass Fire Dept.	NAPS-D-7	37.27	+/-	12.21
Louisa County – Fred Hall	NAPS-D-8	31.59	+/-	11.24
Louisa County – Aspen Hill	NAPS-D-9	45.86	+/-	13.54
Louisa County – Route 685	NAPS-D-10	39.88	+/-	12.63
Louisa County – Route 700	NAPS-D-11	38.63	+/-	12.43
North Anna Power Station	NAPS-D-12	41.83	+/-	12.93
Pocahontas State Park (Control)	PSP-D-1	49.46	+/-	14.07
Radiological Health	ORH-D-1	17.69	+/-	8.41
Radiological Health	ORH-D-2	20.85	+/-	9.13

# Virginia Department of Health

## VEGETATION

January 1, 2017 through December 31, 2017

Location	Date collected	Type	Isotope	Results pCi/Gram (wet weight)
<b>Surry County</b>	<b>03/13/17</b>			
<b>Private garden</b>		Mixed Greens	I-131	<0.01
<b>SPS-V-1</b>			Cs-134	<0.01
			Cs-137	<0.01
<b>Louisa County</b>	<b>03/13/17</b>			
<b>Private Garden</b>		Mixed Greens	I-131	<0.01
<b>NAPS-V-1</b>			Cs-134	<0.01
			Cs-137	<0.01
<b>Surry County</b>	<b>09/25/17</b>			
<b>Private garden</b>		Mixed Greens	I-131	<0.01
<b>SPS-V-1</b>			Cs-134	<0.01
			Cs-137	<0.01
<b>Louisa County</b>	<b>09/25/17</b>			
<b>Private Garden</b>		Mixed Greens	I-131	<0.01
<b>NAPS-V-1</b>			Cs-134	<0.01
			Cs-137	<0.01

Note: Vegetation is collected bi-annually when available.

# COMMONWEALTH OF VIRGINIA

## DEPARTMENT OF HEALTH

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### OFFICE OF RADIOLOGICAL HEALTH

109 Governor Street, 7<sup>th</sup> Floor, Richmond, Virginia 23218-2448

Office (804) 864-8150

Fax (804) 864-8175

# BABCOCK & WILCOX



# Virginia Department of Health

## AIR PARTICULATE COMPOSITE SAMPLES

January 1, 2017 through December 31, 2017

Eastern Site Boundary – Ball field

### FIRST QUARTER REPORT

	Start	Date	Stop	Gross Alpha Activity pCi/meter <sup>3</sup>
<b>B&amp;W-A-1</b>				
1st	01/04/17	-	01/10/17	0.0004 +/- 0.0004

### SECOND QUARTER REPORT

	Start	Date	Stop	Gross Alpha Activity pCi/meter <sup>3</sup>
<b>B&amp;W-A-1</b>				
2nd	04/05/17	-	04/11/17	0.001 +/- 0.001

### THIRD QUARTER REPORT

	Start	Date	Stop	Gross Alpha Activity pCi/meter <sup>3</sup>
<b>B&amp;W-A-1</b>				
3rd	07/05/17	-	07/11/17	0.001 +/- 0.001

### FOURTH QUARTER REPORT

	Start	Date	Stop	Gross Alpha Activity pCi/meter <sup>3</sup>
<b>B&amp;W-A-1</b>				
4 <sup>th</sup>	10/04/17	-	10/10/17	0.001 +/- 0.001

# Virginia Department of Health

## SOIL

January 1, 2017 through December 31, 2017

### Eastern Site Boundary / Six Mile Bridge Shoreline

Location	Date	Distance & Direction	Type	Alpha Activity ppm
Eastern Site Boundary Ball field B&W-S-1	06/22/2017	Site Boundary	Soil	<1.0
James River Shoreline Near Six Mile Bridge "control" B&W-S-2	06/22/2017	1.5 miles SW	Soil	<1.0

Soil samples collected annually.

Note: Uranium separation followed by alpha counting.

## SURFACE WATER

January 1, 2017 through December 31, 2017

### Eastern Site Boundary Shoreline / Six Mile Bridge Shoreline

Location	Date	Distance & Direction	Alpha Activity ppb
James River Shoreline Near Ball field at eastern site boundary B&W-W-1	06/22/2017	Approx. 3 miles downstream	<2.0
James River Shoreline Near Six Mile Bridge "control" B&W-W-2	06/22/2017	Approx. 1.5 miles upstream	<2.0

Surface water samples collected annually.

Note: Uranium separation followed by alpha counting.

# Virginia Department of Health

## VEGETATION

January 1, 2017 through December 31, 2017

Eastern Site Boundary / James River Shoreline

Location	Date	Distance & Direction	Alpha Activity ppm
Eastern site boundary Ball field B&W-V-1	06/22/2017	Approx. 3 miles downstream	<1.0
James River Shoreline off Rt. 460 "control" B&W-V-2	06/22/2017	Approx. 4.5 Miles SW	<1.0

Vegetation collected annually.

Note: Uranium separation followed by alpha counting.

COMMONWEALTH OF VIRGINIA  
DEPARTMENT OF HEALTH

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OFFICE OF RADIOLOGICAL HEALTH  
109 Governor Street, 7<sup>th</sup> Floor, Richmond, Virginia 23219  
Office (804) 864-8150  
Fax (804) 864-8175

EMERGENCY  
PREPAREDNESS

# EMERGENCY PREPAREDNESS

The Office of Radiological Health (ORH) located within the Virginia Department of Health (VDH) is one of the lead response agencies for emergencies involving the potential or actual release of radioactive materials. Overall, state level emergency response is described in the Commonwealth of Virginia Radiological Emergency Response Plan (COVERP), which is developed and maintained by the Virginia Department of Emergency Management (VDEM). In addition to generic guidelines for responding to any major radiological emergency, the response procedures contain segments addressing response to several specific types of radiological incidents. This includes sections which provide information needed for response to Licensee and Transportation accidents. Other sections contain background information and response guidance for accidents at fixed nuclear facilities. Plans are also being developed to respond to possible radiological terrorist attacks, which may include detonation of a radiological dispersion device (RDD aka “dirty bomb”), an improvised nuclear device (IND), or a military grade nuclear warhead.

When responding to any radiological emergency, the primary tasks of the Office of Radiological Health are to locate, identify, and predict the impact of any radioactive materials released to the environment. Based on the predicted or known impact, ORH then recommends appropriate measures to protect the public. ORH would also be tasked with helping to supervise the cleanup of radiological contamination and ensuring the proper disposal of radioactive waste. An ORH duty officer maintains 24-hour coverage to provide initial assessment/assistance for local responders and may also initiate the mobilization/deployment of other trained staff to respond to a radiological emergency when needed.

Under the provisions of current Federal Emergency Management Agency (FEMA) regulations, ORH conducts or participates in periodic drills that are designed to provide team training and to test emergency plans and procedures. The scope of these drills ranges from receiving and acknowledging simulated emergency communications to full-scale team deployment.

Federal regulations for commercial nuclear power generating facilities stipulate that a full-scale exercise involving appropriate local government participation and testing all significant response elements must be conducted and evaluated every other year. Because there are two such facilities, Surry and North Anna Nuclear Power Stations, Commonwealth of Virginia agencies will perform exercise activities on a yearly basis, alternating between the sites each year.